TX-28

SERIAL NO. 3224

ONKYO SERVICE MANUAL

QUARTZ SYNTHESIZED TUNER AMPLIFIER MODEL TX-28

Black and Silver models

BUD, BUDN,UD	120V AC, 60Hz
BUG, UG	220V AC, 50Hz
BUQA	240V AC, 50Hz
BUW, UW	120 or 220V AC, 50/60Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

SPECIFICATIONS

AMPLIFIER SECTION

Power output:	45 watts per channel,min RMS,at 8 ohms, both channels driven,from 20Hz to 20kHz, with no more than 0.08% THD.	
Musical Power Output:	2 ×98 watts at 4 ohms,1kHz (DIN)	
	2 ×75 watts at 8 ohms,1kHz (DIN)	
Continuous Power Output:	2 ×60 watts at 4 ohms,1kHz (DIN)	
	2 ×50 watts at 8 ohms,1kHz (DIN)	
Total Harmonic Distortion:	0.08% at rated power	
	0.08% at 1 watt output	
IM Distortion:	0.08% at rated power	
	0.08% at 1 watt output	
Damping Factor:	35 at 8 ohms	
Frequency Response:	20-30,000Hz ± 1dB	
RIAA Deviation:	20-20,000Hz ±0.8dB	
Sensitivity and Impedance:	Phono:	2.5mV/50kohms
	CD/Tape Play:	150mV/50kohms
	Tape Rec:	150mV/3.5kohms (Phono)
Phono overload:	150mV RMS at 1kHz,0.08% THD	
Signal-to-Noise Ratio:	Phono:	85dB(at 10mV input, A weighted)
		75dB(IHF A-202)
	CD/Tape:	95dB(A weighted)
		80dB(IHF A-202)
Tone Controls:	Bass:	± 10dB at 100Hz
	Treble	± 10dB at 10kHz
Loudness(-30dB):	-7dB at 70Hz, +5dB at 10kHz	

TUNER SECTION	**-G/Q/W model-**		**-120V model-**	
FM:				
Tuning Range:	87.50-108.00MHz(50kHz steps)		87.5-108.0MHz(100kHz steps)	
Usable Sensitivity:	Mono:	12.8dBf, 1.2μV,75 ohms	Mono:	11.2dBf, 2.0μV
		1.0 μV(S/N 26dB,40kHz Devi.)	Stereo:	17.2dBf, 4.0μV
		75 ohms DIN		
	Stereo:	18.0dBf, 2.2μV,75 ohms		
		23μV(S/N 46dB,40kHz Devi.)		
		75 ohms DIN		
50dB Quieting Sensitivity:	Mono:	18.0dBf, 2.2μV,75 ohms	Mono:	17.2dBf, 4.0μV
	Stereo:	37.2dBf, 20 μV,75 ohms	Stereo:	37.2dBf, 40 μV
Capture Ratio:	1.5dB	1.5dB		
Image Rejection Ratio:	85dB	40dB		
IF Rejection Ratio:	90dB	90dB		
Signal-to-Noise Ratio:	Mono:	71dB	Mono:	71dB
	Stereo:	66dB	Stereo:	66dB
Selectivity:	50dB DIN (±300kHz,40kHz Devi.)		———	
ACA:	———		55dB	
AM Suppression Ratio:	50dB		50dB	
Harmonic Distortion:	Mono:	0.15%	Mono:	0.15%
	Stereo:	0.30%	Stereo:	0.30%
Frequency Response:	30-15,000Hz ±1.5dB		30-15,000Hz ±1.5dB	
Stereo Separation:	45dB at 1kHz		45dB at 1kHz	
	30dB at 100-10,000Hz		30dB at 100-10,000Hz	
Muting Level:	17.2dBf, 2μV		17.2dBf, 4μV	
Stereo Threshold:	17.2dBf, 2μV		17.2dBf, 4μV	
AM:				
Tuning Range:	522-1,611kHz(9kHz steps)		520-1,710kHz(10kHz steps)	
Usable Sensitivity:	30μV		30μV	
Image Rejection Ratio:	40dB		40dB	
IF Rejection Ratio:	40dB		40dB	
Signal-to-Noise Ratio:	40dB		40dB	
Harmonic Distortion:	0.7%		0.7%	

GENERAL

Dimensions(W×H ×D):	435 ×112 ×343mm	435 ×112 ×343mm
	17-1/8" ×4-7/16" ×13-1/2"	17-1/8" ×4-7/16" ×13-1/2"
Weight:	7.5kg.,16.5lbs.	7.5kg.,16.5lbs.

Specifications and features are subject to change without notice.

SERVICE PROCEDURES

1.Replacing the fuses

For continued protection against fire hazard,replace only with same type and same rating fuse.

D (120V) model

Circuit no.	Part no.	Description
F501,F601	252059	4A(SS-2),Speaker protection
F901	252049	4A(ST-6),Primary

G (220V) and Q (240V) models

Circuit no.	Part no.	Description
F501,F601	252076	3.15A-SE-EAK,Speaker protection
F902	252074	2A-SE-EAK,Primary
F903,F904	252078	5A-SE-EAK,Secondary
F905	252078	1A-SE-EAK,Secondary

W (Worldwide) model

Circuit no.	Part no.	Description
F501,F601	252059	4A(SS-2),Speaker protection
F901	252049	4A(ST-6),Primary
F902	252074	2A-SE-EAK,Primary

2.Replacing the lamp

This unit uses the lamp listed below.

Circuit no.	Part no.	Description
PL901	210064A	PL6.3V,250mA,Dial plate illumination

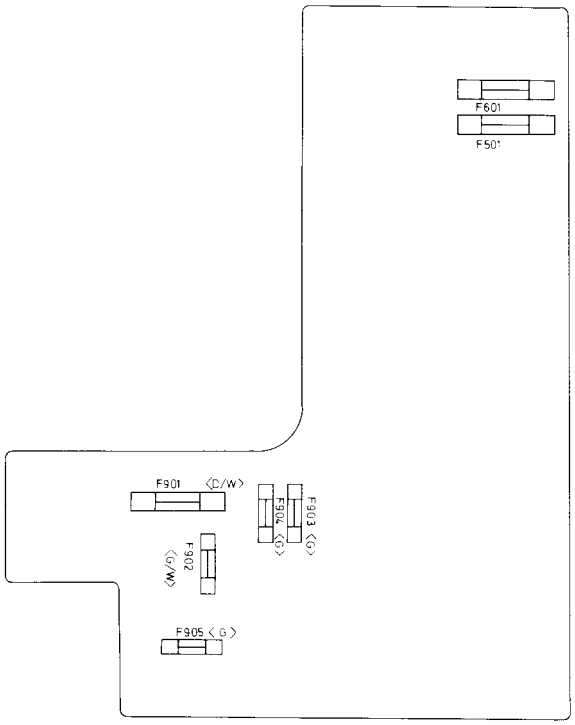
3.Safety-check out

(Only U.S.A. model)

After correcting the original service problem,perform the following safety check before releasing the set to the customer.

Connect the insulating-resistance tester between the plug of power suuply cord and terminal GND on the back panel.

Specifications: 3.3Mohm ±10% at 500V.



〈Fig.1〉

4.Removement of the digital pc board

①。 Remove the five screws holding the top cover and chassis (side bracket:4, back panel:1),and remove the top cover.

②。 Remove the five screws holding the front panel and front bracket, and remove the front panel.

③。 Set the shift switch to 1-8 position, and remove the shift knob(A809).

④。 Remove the four nails of holder,switch(A10) from the front bracket,and remove the holder,switch.

⑤。 Remove the holder,dial plate(A15).

⑥。 Set the volumes of Dynamic bass ot the minimum position.

⑦。 Remove the stopper of headphone terminal.

⑧。 Remove the two screws holding the front bracket and holder,and remove the holder.

⑨。 Remove the two screws holding the front bracket and holder L.E.D. on the digital pc board.

⑩。 Remove the digital pc board from the three bent sections of domw side of front bracket.
(Refer the exploded view of next page.)

5.Step band selector switch

Worldwide models are equipped with a step band selector switch. This switch is located on the back panel. This switch is set to 50kHz (FM) and 9kHz (AM) at the factory, but may have to be reset to 100kHz and 10kHz depending on the area where the unit is used.

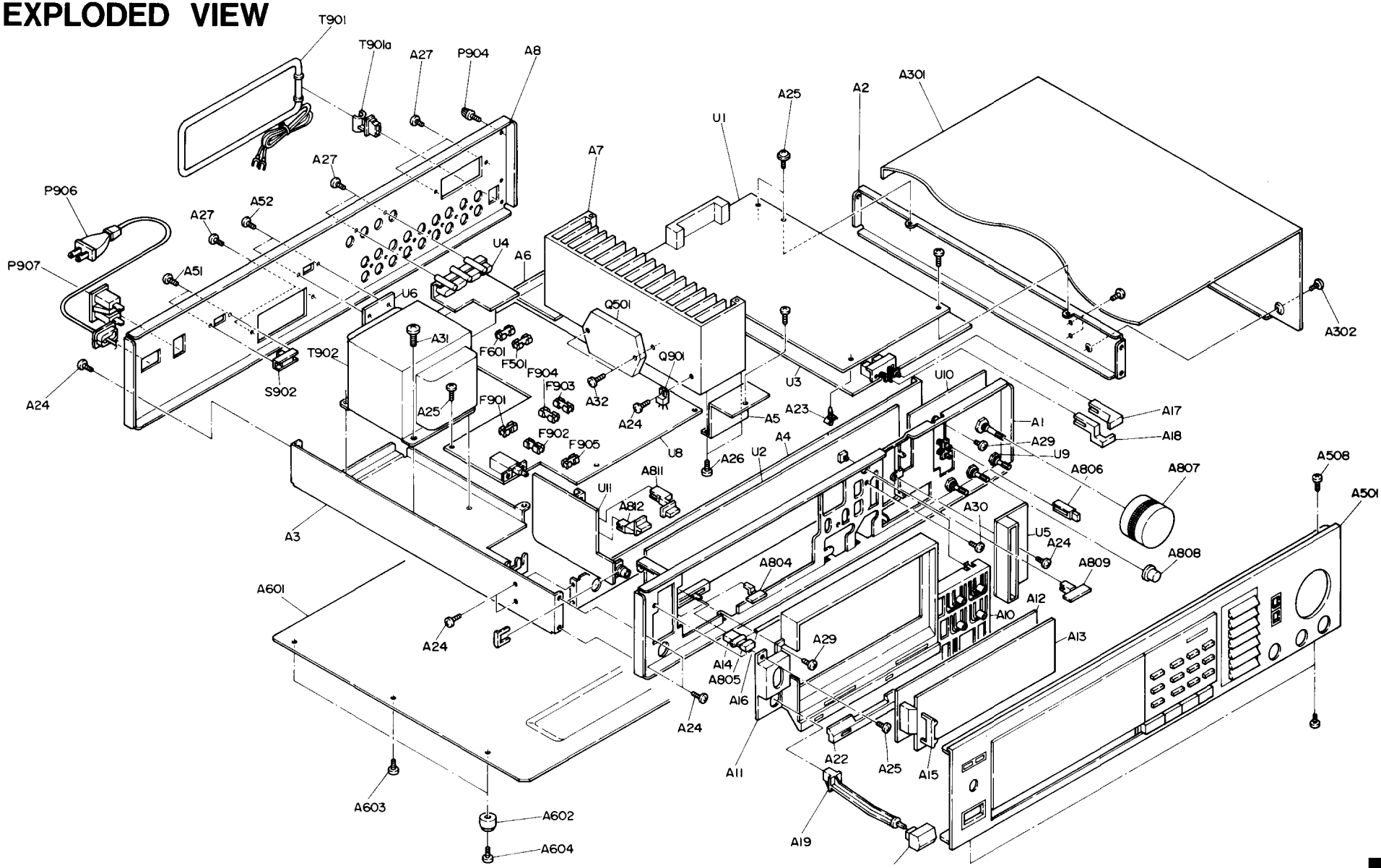
	De-emphasis	FM step	AM step
Europe:	50μsec	50kHz	9kHz
U.S.A.:	75μsec	100kHz	10kHz

6.Change of voltage

Worldwide models are equipped with a voltage selector to conform with local power supplies. This switch is located on the back panel. Be sure to set this switch to match the voltage of the power supply in your area before turning the power switch on.

This swith is set to 220V at the factory. Voltage is changed by sliding the groove in the switch with the screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on.

EXPLODED VIEW



NOTE: THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBERS SPECIFIED.

PARTS LIST

REF. NO.	PART NO.	DESCRIPTION
A1	27110274A	Front bracket
A2	27115180A	Side bracket R
A3	27130388B	Bracket,power transformer
A4	27130422	Bracket,center
A5	27141057	Bracket C
A6	27141058	Bracket,radiator
A7	27160185	Radiator
A8	27120822	Back panel <D>
	27120823	Back panel <G>
	27120825	Back panel <W>
	27120841	Back panel <Q>
A10	27190436A	Holder,switch
A11	27190440A	Holder
A12	28133160	Back plate
A13	28130235	Dial plate
A14	27220032A	Slider
A15	27190359A	Holder,dial plate
A16	27260171B	Shaft
A17	27273048	Joint T-1
A18	27273049	Joint T-2
A19	27273030C	Joint
A20	28140104	12×30×8mm,Cushion
A21	27300750	⚠Strainrelief
A22	27267402A	Guide
A23	27190011	Holder
A24	834430068	3TTS+6B(BC),Tapping screw
A25	831130088	3TTW+8B,Tapping screw
A26	838440089	4TTB+8C(BC),Tapping screw
A27	834430108	3TTS+10B(BC),Tapping screw
A28	834230108	3TTS+10B(Ni),Nickel screw
A29	82143006	3P+6FN(BC),Pan head screw
A30	833430080	3TTP+8P(BC),Tapping screw
A31	830440089	4TTC+8C(BC),Tapping screw
A32	834430168	3TTS+16B(BC),Tapping screw
A33	27150218	Shielded plate
A301	28184271A	Top cover <S>
	28184272B	Top cover <B>
A302	834430068	3TTS+6B(BC),Tapping screw
A501	18628121	Front panel ass'y <S>
	18638121	Front panel ass'y <B>
A508	838430068	3TTB+6B(BC),Tapping screw
A601	27170198-1	Bottom board
A602	27175009A	Leg
A603	834430068	3TTS+6B(BC),Tapping screw
A604	834430128	3TTS+12B(BC),Tapping screw

REF. NO.	PART NO.	DESCRIPTION
A801	28322454A	Knob ass'y,selector <S>
	28322471A	Knob ass'y,selector <B>
A802	28322464	Knob ass'y <S>
	28322479	Knob ass'y <B>
A804	28322466A	Knob,expander
A805	28322006	Knob,slide
A806	28322467A	Knob,loudness <S>
	28322481A	Knob,loudness <B>
A807	28322468	Knob,volume <S>
	28322482	Knob,volume <B>
A808	28322008	Knob,balance <S>
	28322021 1	Knob,balance <B>
A809	28322009A	Knob,stereo <S>
	28322022A	Knob,stereo <B>
A810	28321928	Knob,power <S>
	28321905B	Knob,power <B>
A811	28322469	Knob,speaker A <S>
	28322304-1	Knob,speaker A <B>
A812	28322470	Knob,speaker B <S>
	28323305-1	Knob,speaker B <B>
F501,601	252059	⚠4A(SS-2),Speaker protection fuse <D/W>
F501,601	252076	⚠3.15A-SE-EAK,Speaker protection fuse <G>
F901	252049	⚠4A(ST-6),Primary fuse <D/W>
F902	252074	⚠2A-SE-EAK, Primary fuse <G/W/Q>
F903,904	252078	⚠5A-SE-EAK,Secondary fuse <G/Q>
F905	252070	⚠1A-SE-EAK,Secondary fuse <G/Q>
P904	25060044	Terminal,ground
P906	253123	⚠AS-UC-6#18,Power supply cord <D>
	253128 or 253130	⚠AS-CEE,Power supply cord <G/W>
	253118	⚠AS-SAA,Power supply cord <Q>
P907	25050290	⚠NSCT-2P118T,AC outlet <D>
Q501,601	222054	STK4863,Power amplifier IC
Q901	222780122	78M12, Constant voltage IC
S902	25065123	⚠NPS-1258P,Voltage selector switch <W>
	82142604	2.6P+4F(BC),Pan head screw for S902<W>
T901	232085	NMA-3034,AM loop antenna
T901a	27190105	Holder,antenna
T902	2300083	⚠NPT-914D,Power transformer <D>
	2300084	⚠NPT-914G,Power transformer <G>
	2300085	⚠NPT-914DG, Power transformer <W>
	2300086	⚠NPT-914Q,Power transformer <Q>

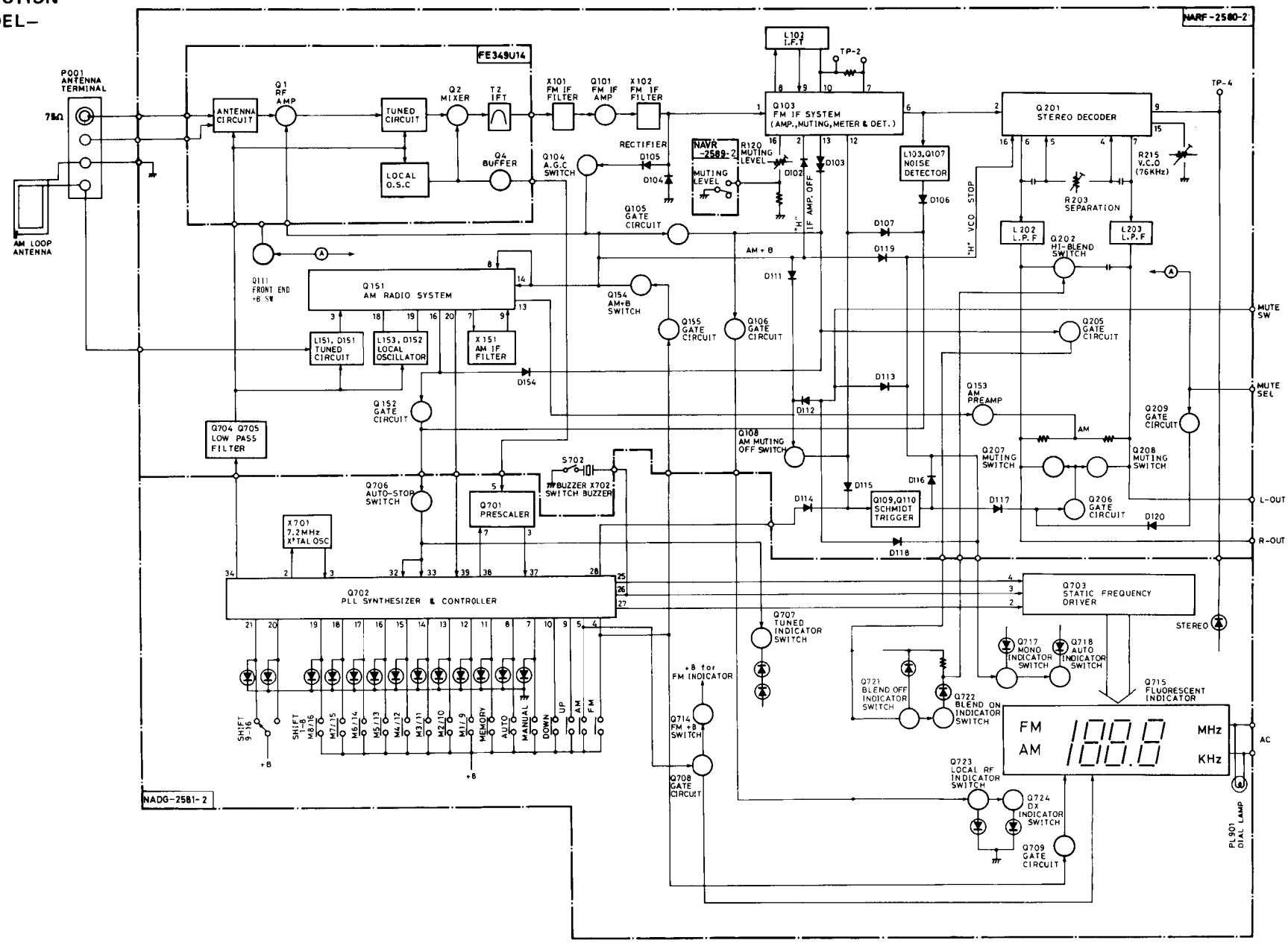
REF.NO.	PART NO.	DESCRIPTION
U1	18628580-2	NARF 2580-2,Tuner circuit pc board ass'y <D>
	18624580-2A	NARF 2580 2A, Tuner circuit pc board ass'y <G/Q>
	18630580-2B	NARF-2580-2B, Tuner circuit pc board ass'y <W>
U2	18628581-2	NADG-2581-2,Digital circuit pc board ass'y <D>
	18624581-2A	NADG-2581-2A,Digital circuit pc board ass'y <G/Q>
	18630581-2B	NADG-2581-2B,Digital circuit pc board ass'y <W>
U3	18628582-2	NAEQ-2582-2,Equalizer ampliifier pc board ass'y <D/W>
	18624582-2A	NAEQ-2582 2A, Equalizer ampliifier pc board ass'y <G/Q>
U4	18608583-1	NAVD-2583-1,Video circuit pc board ass'y
U5	18608584-1	NASW-2584-1,Selector Switch pc board ass'y
U6	18630585-1	NASW-2585-1,Band selector Switch pc board ass'y <W>
U8	18628587-2	NAMA-2587-2,Power amplifier and Power supply pc board ass'y <D>
	18624587-2A	NAMA-2587-2A, Power amplifier and Power supply pc board ass'y <G/Q>
	18630587-2B	NAMA-2587-2B, Power amplifier and Power supply pc board ass'y <W>
U9	18608588-1	NATC-2588-1, Tone control pc board ass'y
U10	18628589-2	NAVR-2589-2,Volume pc board ass'y
U11	18608590-1	NAHP-2590-1,Headphone terminal pc board ass'y <G/W/Q>
	18618590-1A	NAHP-2590-1A, Headphone terminal pc board ass'y <D>

Note; <D>:Only 120V model
<G>:Only 220V model
<W>:Only Worldwide model
<Q>:Only 240V model
<S>:Only Silver model
<B>:Only Black model

BLOCK DIAGRAM

–TUNER SECTION–

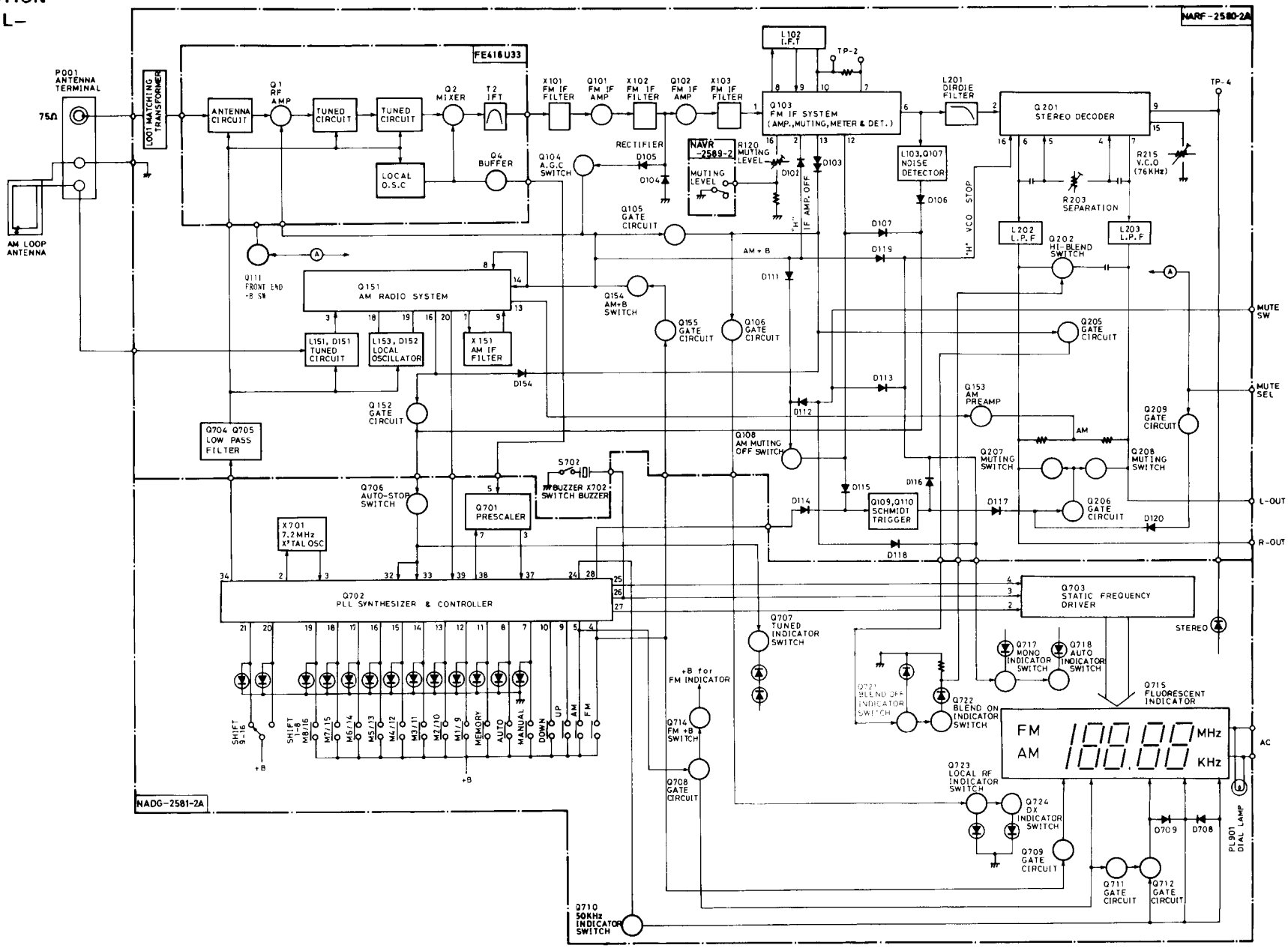
–120V MODEL–



BLOCK DIAGRAM

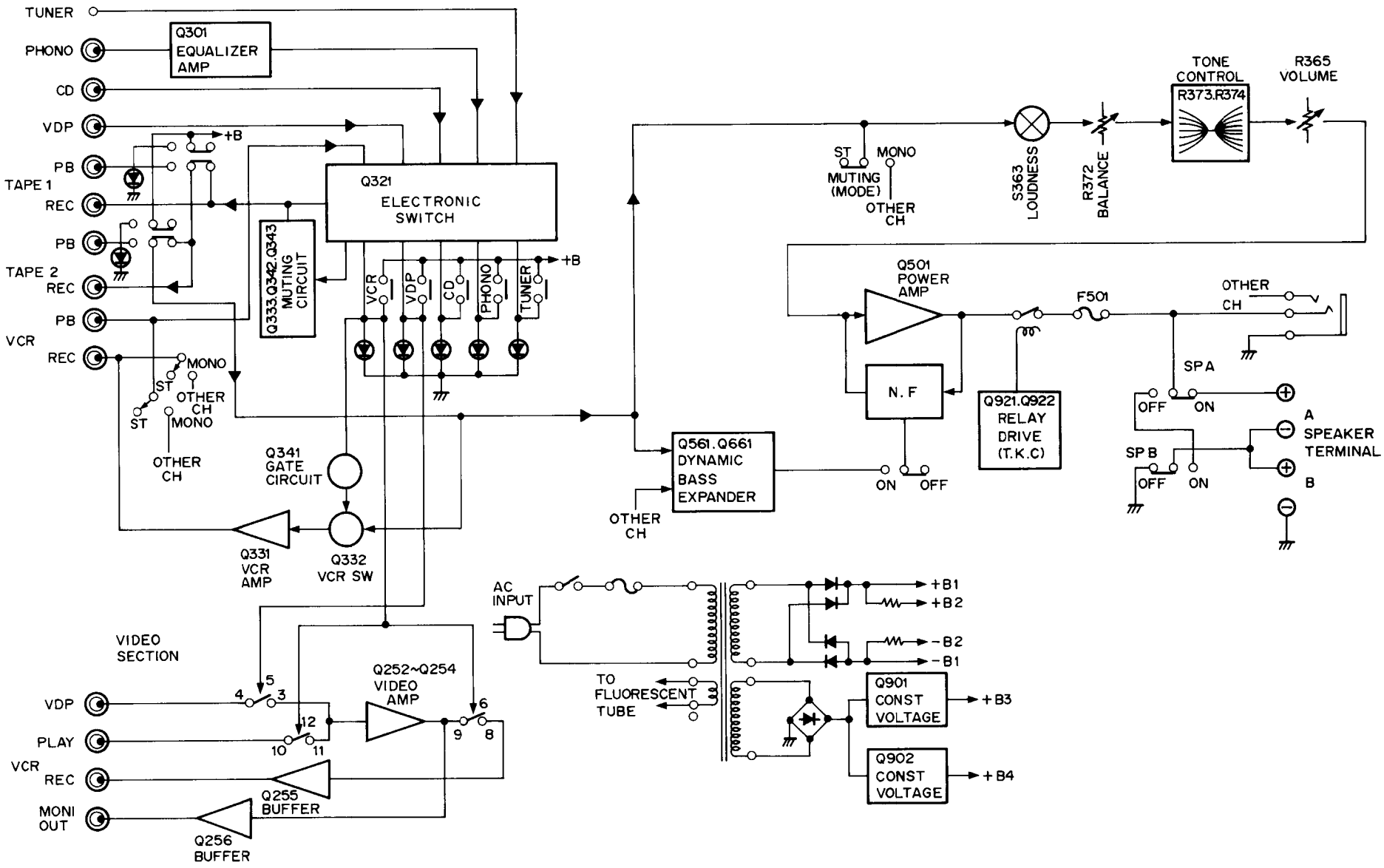
–TUNER SECTION–

–220V MODEL–



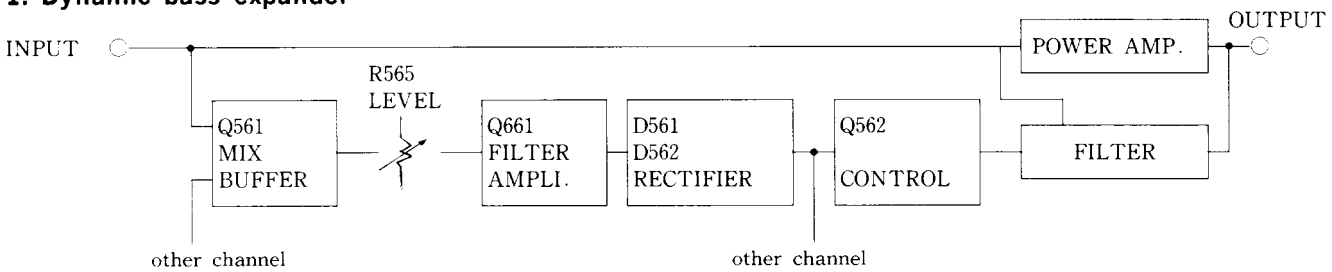
BLOCK DIAGRAM

–AMPLIFIER SECTION–



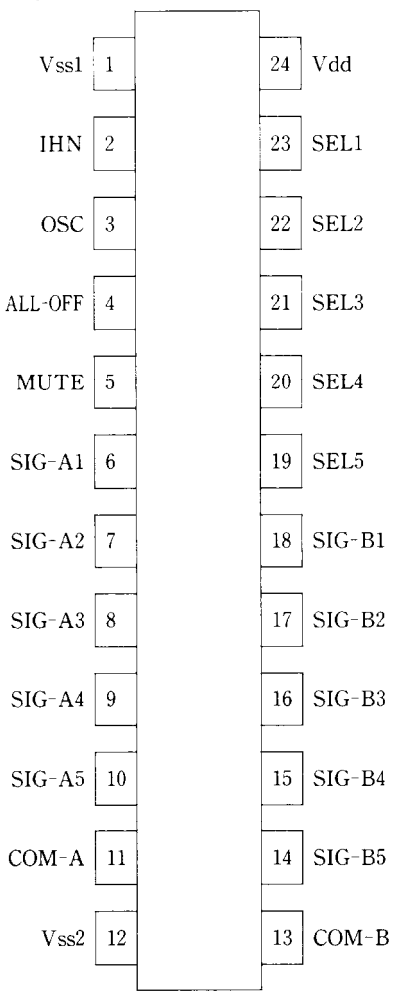
CIRCUIT DESCRIPTIONS

1. Dynamic bass expander



In earlier super base systems, only the frequencies about 70Hz were boosted by about 4dB to expand the playback frequency response to enable playback of the super low region. However,when there was no input signal, the above frequency response resulted in deterioration in the S/N ratio in the 70Hz region. This problem has been overcome by the dynamic bass expander where the 70Hz boosted level is varied according to the input signal level.That is,the frequency response remains flat when no input signal is applied,but is boosted at the 70Hz region to the specified level when the input signal exceeds a certain level.The left and right channel input signals from the INPUT terminals are mixed by Q561 and pass through the level volume and filter amplifier.The signal is rectified by D561 and D562,and the resultant DC componemt control signal is applied to the gate of Q562.When the input signal is at a adequate level,Q562 is turned on and the super base circuit of power amplifier is controlled by the input signal.

2. Operation of analog switch



1.Vssl · · · Connect to the ground.
2.INH · · · Inhibit input terminal.Operates normally at the high level. Inhibit status at the low level.
3.OSC · · · CR connection terminal for the oscillator that determines the muting time and selector timing of analog switch.
4.ALL-OFF · Off designation input terminal of analog switches.All analog switches turn off at the high level.
5.MUTE · · Muting signal output terminal. If an "H" level input is received at this selection input terminal (SEL-1 ~SEL-5), this terminal becomes "H" level for a fixed period only. Within that period the analog switch changes.
6.SIG-A1 · · Signal input terminal.
18.SIG-B1 If SEL-1 is selected, analog switch 1 goes ON, and conductivity exists between this terminal and the COM terminal.
7-10.SIG-A2 ~SIG-A5·····Same as above.
17-14.SIG-B2~SIG-B5
11.COM-A · Analog switch common terminal.
13.COM-B
23.SEL-1 · · Selector input terminals for the various analog switches.
22.SEL-2 If an "H" level is set for the SEL-1 ~SEL-5 terminals,each analog
21.SEL-3 switch that is selected goes ON. SEL-1,SEL-2,SEL-3,SEL-4,and
20.SEL-4 SEL-5 are of the matually reset type. If there is other than
19.SEL-5 select input, they go OFF.
24.Vdd · · · Terminal of the power supply voltage.

Pin No.	Symbol	Terminal	Description
34	DO 1	Error output	Charge pump output of the phase detector which constitutes the PLL. High level is output when the divided oscillation frequency is high than the reference frequency. In the opposite case, low level is output. Floating occurs when the frequencies match. The output is applied to the variable capacitor diode in the front end through low pass filter Q704 and Q705. The output from both terminals is the same, but only DO1 is used.
35	DO 2		
36	TEST	Test terminal	Test mode at the high level.
37	FM IN	FM programmable counter input	Connect to the prescaler output (pin 3 of Q701)
38	PSC	Pulse swallow control output	Output to the control the division ratio of the prescaler.
39	AM IN	AM local oscillator signal input	Terminal for input of AM local oscillator signal.
40	$\overline{\text{INH}}$	Inhibit input	Operates normally at the high level. Inhibit status at the low level.
41	$\overline{\text{INT}}$	Initialize input	Operates normally at the high level. At the low level, the internal status is initialized.
42	Vdd	Power supply	Device power terminal: supplies 5V during the normal operation and 2.5V from the super capacitor (C712) for the memory preservation.

Table 1

E1 (Pin 30)	E2 (Pin 29)	Region	Band	Frequency range	Intermediate Frequency	Scan step	Reference Frequency
0	1	U.S.A	FM	87.5~108.0MHz	+10.7MHz	100kHz	25kHz
			AM 1	520 ~1710kHz	+450kHz	10kHz	10kHz
1	1		AM 2	522 ~1710kHz	+450kHz	9kHz	9kHz
1	0	Europe	FM	87.50 ~108.00MHz	+10.7MHz	50kHz	25kHz
			MW	522 ~1611kHz	+450kHz	9kHz	9kHz
			LW	153 ~360kHz	+450kHz	1kHz	1kHz
0	0	Japan	FM	76.0~90.0MHz	-10.7MHz	100kHz	25kHz
			AM	522 ~1611kHz	+450kHz	9kHz	9kHz

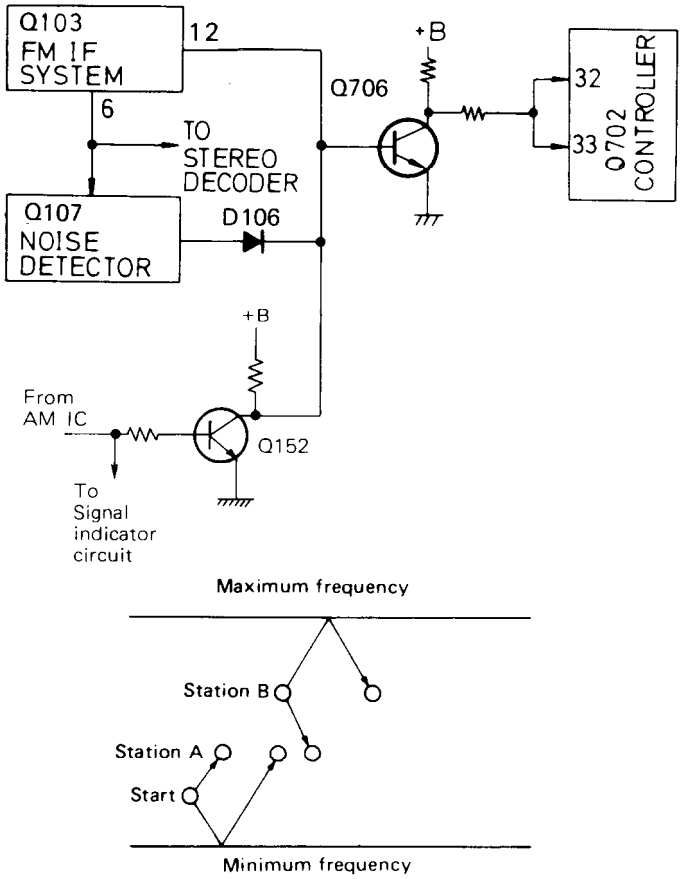
4. Auto Hi-blend and NR switching circuit

The Q103 FM IF system incorporates IC's with a built-in IF level detector with a 13 pin output.
If an input above 38dB enters the antenna, Q205 is turned on, and Q721 is turned on, the Q722 and Q202 are turned off and the high-blend function is turned off.

3. Synthesizer and controller operation

Pin No.	Symbol	Terminal	Description
1	GND	Ground	
2	XT	X'tal	Connected to the 7.2MHz crystal oscillator for the reference frequency.
3	XT		
4	FM	FM band specification input	Mutual reset type, performs switching of each band, FM/MW/LW.
5	MW	MW band specification input	
6	LW	LW band specification input	
7	MANUAL	Manual tuning mode specification input	Mutual reset type, performs auto search and manual operation mode switching during UP/DOWN tuning.
8	AUTO	Auto search tuning mode specification input	
9	UP	UP tuning key input	Connect the push key and perform UP/DOWN tuning.
10	DOWN	DOWN tuning key input	
11	STO	Memory store command input	The preset memory is set to the write mode when the key is pressed.
12~19	M1~M8	Preset memory channel specification input	Controls the write and read out of the internal 16-station preset memory along with the MC1 and MC2 input.
20	MC-1	Memory control input	Set the 16-station preset memory to the 8 FM/8 AM station mode or the FM/AM 2-band 16-station random mode. The 16-station random mode is used in this unit.
21	MC-2		
22	OSC2	AM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the AM search mode.
23	OSC1	FM oscillator terminal	CR connection terminal for the oscillator that determines the scan speed during the FM search mode.
24	0/5	FM 50kHz output	Output that represents the 50kHz FM band tuning step for European models. Goes to the high level for the 50kHz setting.
25	CK2	Tuned frequency data output	Outputs the serial data and timing clock to the tuned frequency display driver.
26	CK1		
27	DATA		
28	MUTE	Muting signal output	Goes to the high level during muting output.
29	E2	Region specification input	See table 1.
30	E1		
31	STOP 3	AM IF signal input	During AM reception, this counts the IF signal and stops auto search.
32	STOP 2	Auto search stop signal input	When the stop 1 input (pin 33) is at the high level and this terminal goes to the high level, auto search is stopped.
33	STOP 1	Scan speed slow input	When the high level is input at this terminal, the auto search speed is cut in half.

5. Auto search tuning circuit



<Fig. 8>

During FM reception,this is operated by the IF level detection and zero cross detection circuits included in the FM IF system IC of Q103 and by the noise component detection circuit of Q107.When a station is tuned,the output of all outputs go to the low level so Q706 goes from on to off, causing pins 32 and 33 of the controller IC to go to the high level to complete auto search tuning.
During AM reception, this is operated by the IF level detection included in the AM radio system IC of Q151. When a station is turned, Q152 goes from off to on and Q706 goes to off, causing pins 32 and 33 of the controller IC to go to the high level to complete auto search tuning.

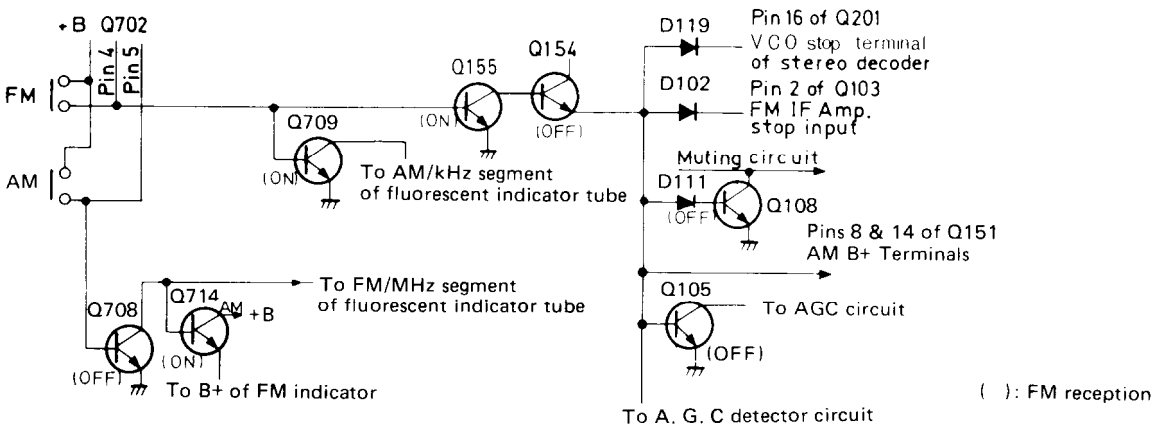
● **Manual tuning**

When the UP or DOWN key is pressed, the frequency goes up or down by one step. When either key is held down, the frequency repidly increases or decreases (scans) and stops when the key is released. When either end of the tuning range is reached,key input will no longer be received and the frequency will stop at the highest or lowest frequency.

● **Auto Tuning**

When the UP or DOWN key is pressed,scanning begins in the up or down direction,stopping where there is a radio station. Since auto scan is operated by a triangular wave,scanning in begun in the opposite direction the instant either end of the tuning range is roached.
Also,if the UP or DOWN key is pressed when the tuned frequency is not at either end of the range,up or down scanning will begin.

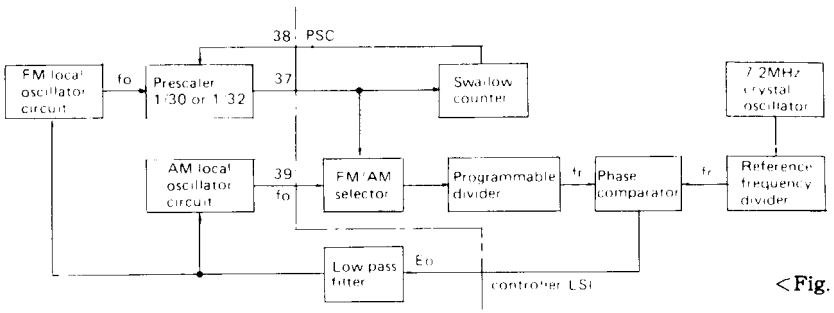
6. FM/AM switching circuit



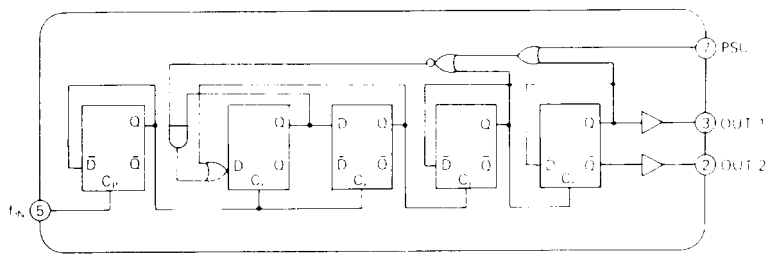
<Fig.9>

The FM/AM selector circuit is shown in the diagram fig.9. Pins 4 and 5 of Q702 are the mutual reset type.For FM, pin 4 is high and pin 5 is low;for AM,pin 4 is low and pin 5 is high.Because pin 5 is high and pin 4 is low during AM reception, Q709 is off,the AM,kHz segments of fluorescent display are turned on.Also,since Q708 goes to on and Q714 turned off,and the FM indicators are turned off.
At the same time,Q155 is turned off and Q154 turned on, so +B is supplied to the power source terminal of the radio system pins 8 & 14 of Q151.
Pin 16 of Q201 goes to the high level, the VCO oscillator stops, and pin 2 of Q103 goes to the high level so that the FM IF amp is also switched off.Also,during AM reception,Q108 is turned on so the muting circuit is off. During FM reception,all of the switching transistors mentioned above perform the opposite operations to switch to the FM mode. Figures in parenthese indicate transistor operation during FM reception.

7. PLL tuned circuit



<Fig. 10>



<Fig.11> TD6104P block diagram

A block diagram of the tuned of the PLL is shown in fig. 10.

Operation during AM reception

The reception frequency is applied to the programmable divider where it is divided to 1/N and output as fv.This is applied to the phase comparator where it is comparated with frequency reference fr(9kHz for G/W models and 10kHz for D model). If fr and fv differ, Eo equal to the difference in frequency is output.Since error output Eo is a pulse waveform, it is passed through the low pass filter to change it into DC voltage Vd,which is applied to the variable capacitor diode in the front end to change the reception frequency,This continues until fv and fr are the same and Eo=0.

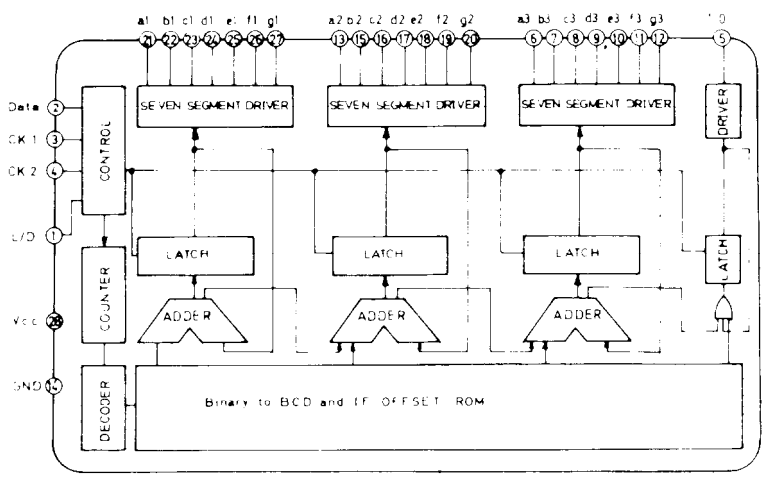
Operation during FM reception

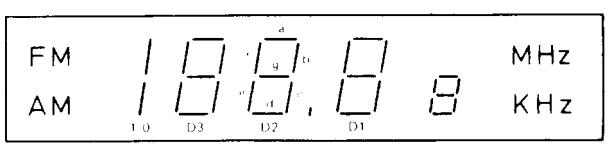
The pulse swallow method is used in the prescaler of this unit. In this type of prescaler, a supplementary number (changed accordimg to the program code input) and the divided reception frequency from the prescaler are combined in the control counter and the prescaler's division factor is switched 1/30 or 1/32 according to external control(1/32 when the PSC terminal is "H" and 1/30 when it is "L").

The station oscillator frequency is applied to the programmble divider,but the programmable divider has an upper frequency limit of only 30MHz,so the pulse swallow-type prescaler,which can be used up to 150MHz,is inserted for division to 1/Np;

The signal is applied to the programmable divider and divided to 1/N. The result is compared with a 25kHz frequency reference in the phase detector and error is output as Eo until a match is obtained as in AM operation.

8. Frequency indicator circuit

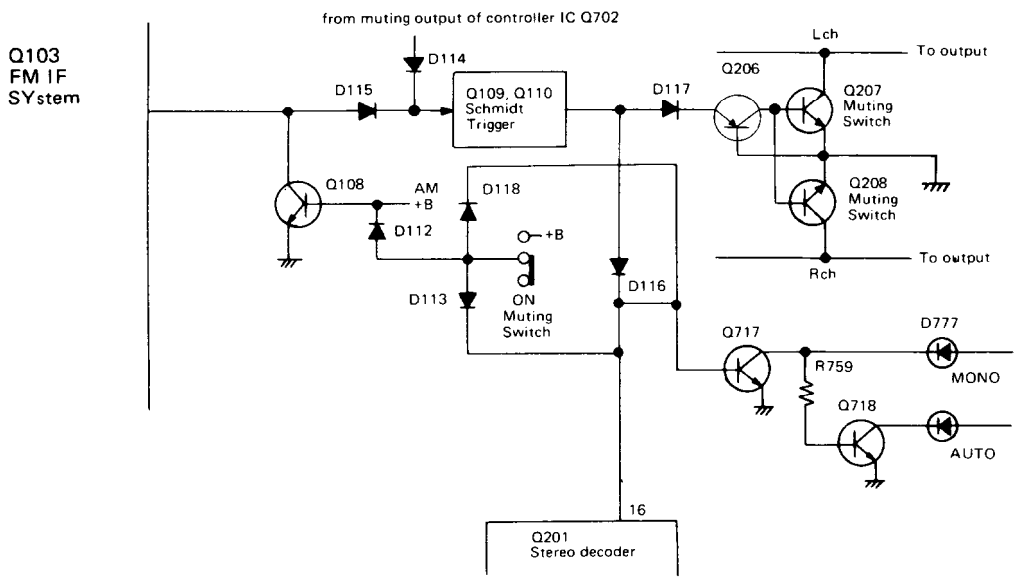




<Fig.12> TD6301AP block diagram

Pin No.	Terminal	Description
1	L/D	Output indication switching input terminal:Fluorescent display at the low level,and LED display at the high level.
2	Data	Tuned frequency data input terminal:Input from the system controller LSI to the serial.
3,4	CK1 CK2	Tuned frequency data input control timing input terminal: Transferred simultaneously with data from the system controller LSI.
5	I/O	Segment drive output terminal:Sets the number of display digit for FM(100MHz) and AM(1000kHz) reception.
6-12	a3-g3	Seven segment drive output terminal:Sets the number of display digit for FM(10MHz) and AM(100kHz) reception.
13, 15-20	a2-g2	Seven segment drive output terminal:Sets the number of display digit for FM(1MHz) and AM(10kHz) reception.
21-27	a1-g1	Seven segment drive output terminal:Sets the number of display digit for FM(100kHz) and AM(1kHz) reception.
14	Vcc	Power source terminal
28	Gnd	Ground

9. Muting circuit



<Fig.13>

The muting circuit operates in the following cases.

1.While pin 28 of controller IC outputs the high level, Q207 and Q208 are turned on and muting is closed in the following cases:(1)While the manual UP/DOWN switch is being held down,(2)When a station in the memory is recalled, and (3)While a radio station is being received using auto search tuning.

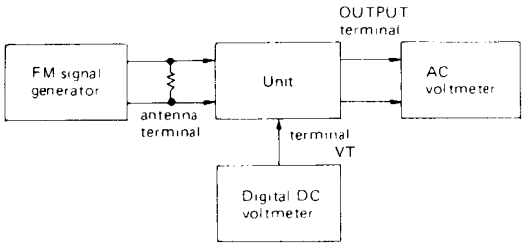
2.When an FM station is not being received (and the muting switch is on).
The IF level in the FM IF system (set at R120 so muting is opened at 17.2dBf) and zero-cross detection circuit (tuning point 55kHz(100kHz step): 30kHz(50kHz step)- are output at pin 12 through the AND circuit.
When a station is turned, the output goes to the low level. When output goes to the low level,Q109 turned off, Q110 is turned on and Q207 and Q208 are turned off, so muting is opened. At the same,pin 16 of stereo decoder Q201 goes to the low level, so the VCO oscillator starts.

ADJUSTMENT PROCEDURES

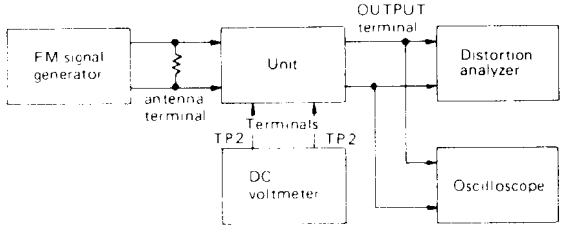
FM section

Item	Step	Connection of instrument	FM SG output	Stereo modulator output	Tuned frequency	Output indicator	Adjustment point	Adjust for	Remarks
Front end	1	Fig.1	———	———	88.0MHz	Digital DC voltmeter	L7	1.4V	Usually not necessary to adjust.
	2		107.9MHz 1kHz,75kHz devi.	———	107.9MHz	AC voltmeter	TC1,TC2(G) TC1(D)	Maximum output	
I F	1	Fig.2	99.0MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.0MHz	DC voltmeter	L102 Primary	0V	Set the muting switch to OFF. Repeat the steps 1 and 2 until no further adjustment is necessary.
	2					Distortion analyzer	L102 Secondary	Minimum	
V C O		Fig.3	99.0MHz 1kHz,75kHz devi. 65dBf(60dB)	———	99.0MHz	Frequency counter	R215	19kHz±10Hz	Set the muting switch to ON.
Stereo distortion		Fig.3	99.0MHz Ext. modulation 65dBf(60dB)	L+R 1kHz 67.5kHz devi.	99.0MHz	Distortion analyzer	T2	Minimum	
Stereo separation	1	Fig.3	99.0MHz Ext. modulation 65dBf(60dB)	Lch. 1kHz	99.0MHz	Rch. AC voltmeter	R203	Minimum	Maximum and same separation
	2			Rch. 1kHz		Lch. AC voltmeter		Minimum	
Muting level	1	Fig.2	99.0MHz 1kHz,75kHz devi. 17.2dBf(12dB)	———	99.0MHz	Oscilloscope	R120	Signal output	Set the muting switch to ON.
	2		99.0MHz 1kHz,75kHz devi. 16.2dBf(11dB)					No output	

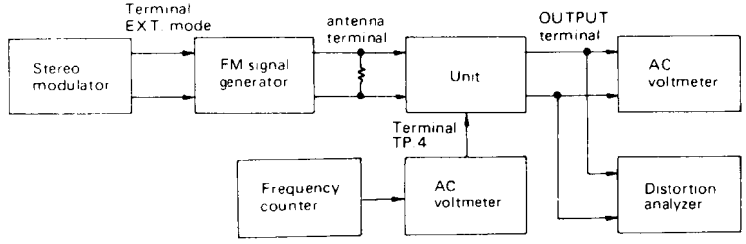
Note: (G):European model (D): Other model



<Fig.1>



<Fig.2>

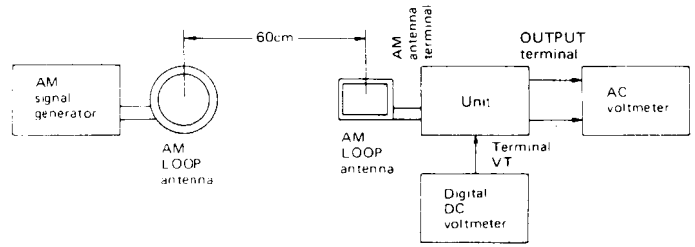


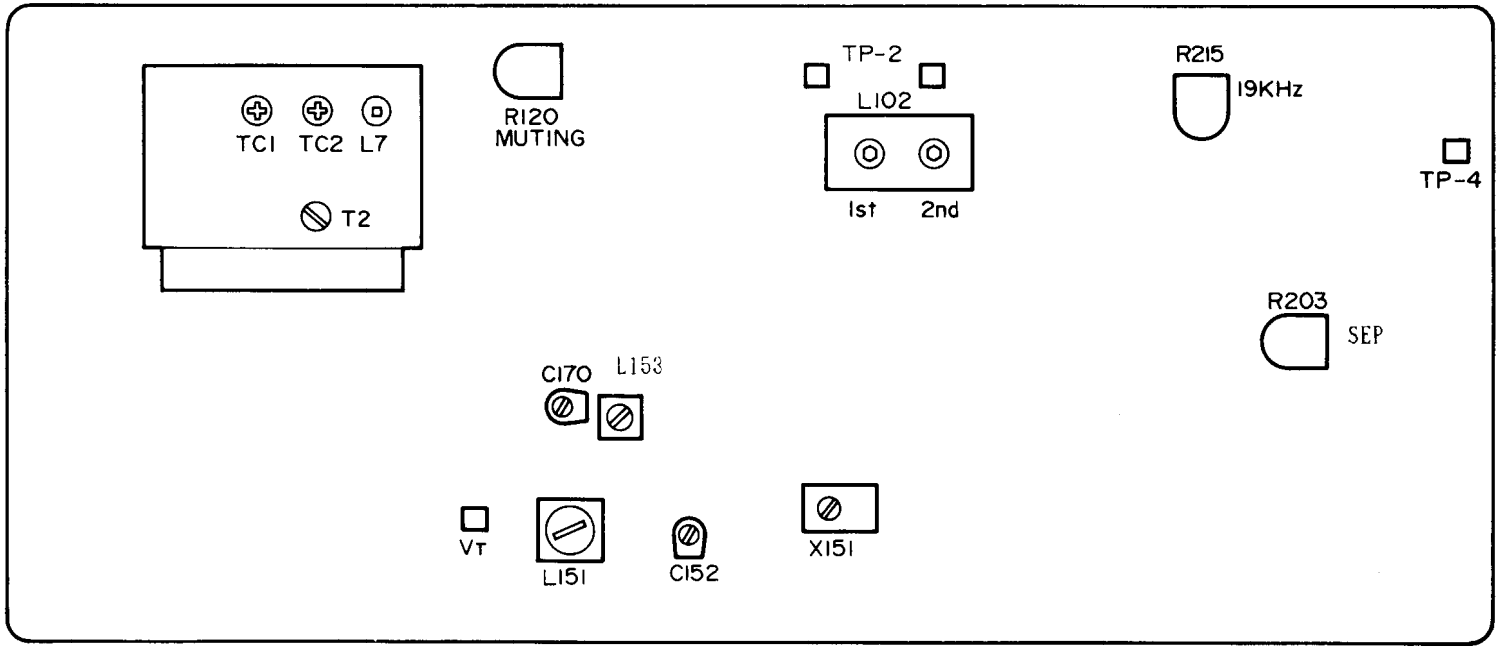
<Fig.3>

AM section

Step	AM SG output	Tuned Frequency	Output indicator	Adjustment point	Adjust for	Remarks
1	————	522kHz (520kHz)	Digital DC voltmeter	L153	1.2V±0.1V	Repeat the steps 1 and 2 until no further adjustment is necessary.
2	————	1611kHz (1710kHz)		C170	9.0V±0.1V (10.5V±0.1V)	
3	603kHz, 60dB/m (600kHz) 400Hz 30% mod.	603kHz (600kHz)	A C voltmeter	L151	Maximum	Repeat the steps 3 and 4 until no further adjustment is necessary.
4	1404kHz, 60dB/m (1400kHz) 400Hz 30% mod.	1404kHz (1400kHz)		C152	Maximum	
5	999kHz, 30dB/m (1000kHz) 400Hz 30% mod.	999kHz (1000kHz)	A C voltmeter	X151	Maximum	

Note: ( ):120V model <10kHz step>





<Fig.14> Adjustment point

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

TUNER PC BOARD

PRINTED CIRCUIT BOARD–PARTS LIST

TUNER PC BOARD(NARF-2580-2/2A/2B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Front end	
TU001	240061	FE349U14 〈D/W〉
TU001	240059	FE416U33 〈G〉
	ICs	
Q103	222540	HA11225
Q151	222701	LA1245
Q201	222678	μPC1161C3
	Transistors	
Q101	2211722 or	2SC1923(R) or
	2211723	2SC1923(O)
Q102	2211255 or	2SC1815(GR) or
	2211256	2SC1815(BL) 〈G〉
Q104,Q105	2211255,	2SC1815(GR),
Q107–Q110	2210746 or	2SC945A(P) or
Q152,Q154	2212485	JC501(Q)
Q155		
Q111,Q209	2211254,	2SC1815(Y),
	2211255,	2SC1815(GR),
	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
Q153,Q106	2211256	2SC1815(BL)
Q202	2211945 or	2SK246(GR) or
	2212304	2SK381(D)
Q205	2211256	2SC1815(BL)
Q206	2211455 or	2SA1015(GR) or
	2212495	JA101(Q)
Q207,Q208	2212794,	2SD1468(R),
	2211705 or	2SD655(E) or
	2211706	2SD655(F)
Q704	2212294 or	2SK108(D) or
	2211293	2SK68(M)
Q705	2211255	2SC1815(GR)

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D101	2243192 or	MTZ-8.2B or
	2239552	RD8.2EB2 〈G〉
D102,D106	223155	1SS138
D103	4000068	VD1222
D104,D105	223132	1K60 〈D/W〉
D108	2243132 or	MTZ4.7B or
	2239432	RD4.7EB2
D109-D120	223155	1SS138
D151,D152	223157	KV1236Z
	Coils	
L001	233312	NFA3051 〈G〉
L101	233105 or	NCCH-1005 or
	233024	NCCH-1501
L103	233031	NMC-9-1
L151	232113	NMA-3049
L153	232110	NMO-4027
L201	233236	NMC-6027 〈G〉
L202,L203	233291	NMC-5039
	Transformer	
L102	233274	NFIF-6041
	Ceramic filters	
X101,X102	3010071	SFE10.7MA5 〈D/W〉
X101	3010046	SFE-10.7MS2GY 〈G〉
X102,X103	3010043	SFE-10.7MM 〈G〉
X151	3010075	SFL-450B3
X152	3010076	BFU-450C

CIRCUIT NO.	PART NO.	DESCRIPTION
	Resistors	
R120	5215045	N08HR10KBC,Semi-fixed
R203	5215048	N08HR200KBC,Semi-fixed
R215	5215044	N08HR5KBC,Semi-fixed
	Socket	
	25050267	NSCT-3P95
	Terminal	
P001	25060085	NTM-4PDMN29,Antenna <D/W>
P001	25060087	NTM-2PDMN31,Antenna <G>
	Bracket	
	27141059	Ground

VIDEO CIRCUIT PC BOARD

VIDEO CIRCUIT PC BOARD(NAVD-2583-1)

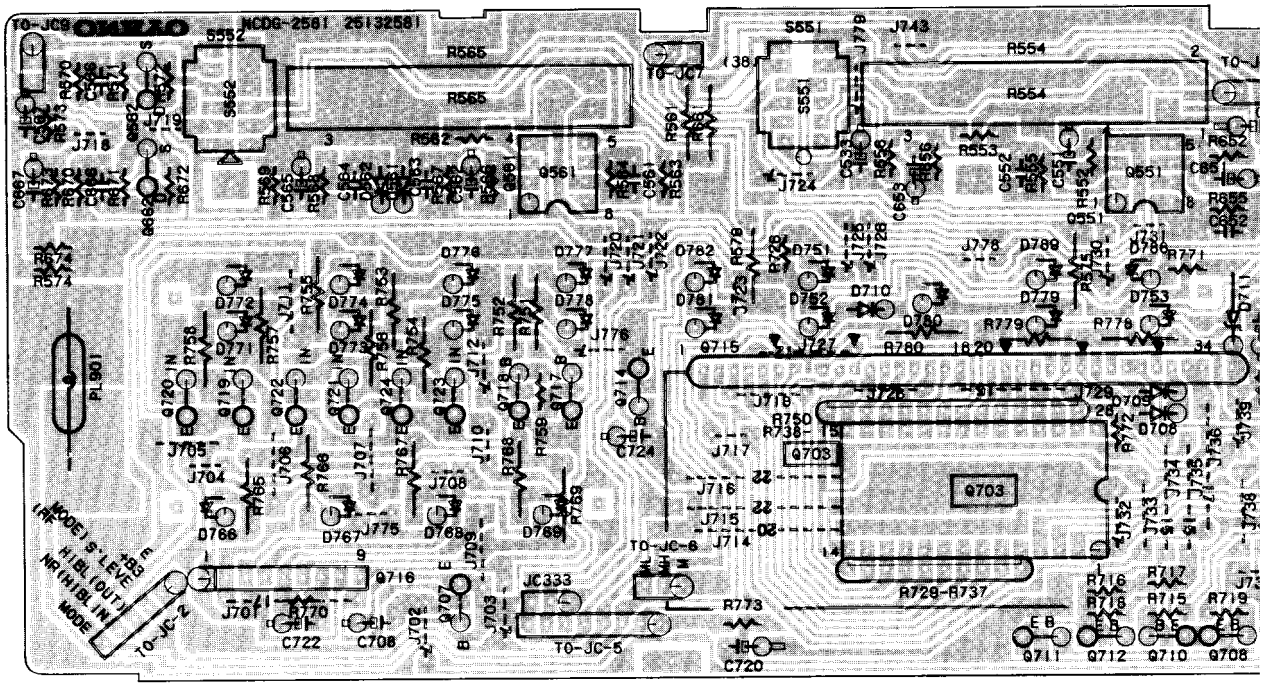
CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C101	352780339	3.3 μF,50V,Elect.
C107,C110	352780109	1 μF,50V,Elect.
C111	352741009	10μF,16V,Elect.
C117	352784799	0.47μF,50V,Elect.
C118	352742209	22μF,16V,Elect.
C120	352741009	10μF,16V,Elect.
C123	352784799	0.47μF,50V,Elect.
C125	352780229	2.2 μF,50V,Elect.
C126	352780109	1 μF,50V,Elect.
C128,C129	352741009	10μF,16V,Elect.
C152,C170	3060010	NTC-20P09,Trimmer
C158	352741009	10μF,16V,Elect.
C161	352744709	47μF,16V,Elect.
C162	352780109	1 μF,50V,Elect.
C165,C166	352750479	4.7 μF,25V,Elect.
C168	370135114	510pF ±5%,100V,APS
C174	352781099	0.1 μF,50V,Elect.
C175	352721019	100 μF,6.3 V,Elect.
C176	352780339	3.3 μF,50V,Elect.
C201	352744719	470 μF,16V,Elect.
C203	352750479	4.7 μF,25V,Elect.
C207,C208	370135614	560pF ±5%,100V,APS <W>
C209,C210	352741009	10μF,16V,Elect.
C212	352782299	0.22μF,50V,Elect.
C213	352780109	1 μF,50V;Elect.
C214	352780339	3.3 μF,50V,Elect.
C215	370134714	470pF ±5%,100V,APS
C220,C221	352780229	2.2 μF,50V,Elect.
C705	395160107	1 μF,35V,Tantalum

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q251	22257502 or 222840661	TC4066BP or 4066B
	Transistors	
Q252	2211455 or 2212495	2SA1015(GR) or JA101(Q)
Q253-Q256	2211254, 2211255, 2210746 or 2212485	2SC1815(Y), 2SC1815(GR), 2SC945A(P) or JC501(Q)
	Capacitors	
C251,C253	352741009	10μF,16V,Elect.
C252,C254	352734719	470 μF,10V,Elect.
C255,C256	352741009	10μF,16V,Elect.
	Terminal	
P251	25045192	NPJ-4PDBL76

Note: <D>:Only 120V model
<G>:Only 220V/240V models
<W>:Only Worldwide model

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE

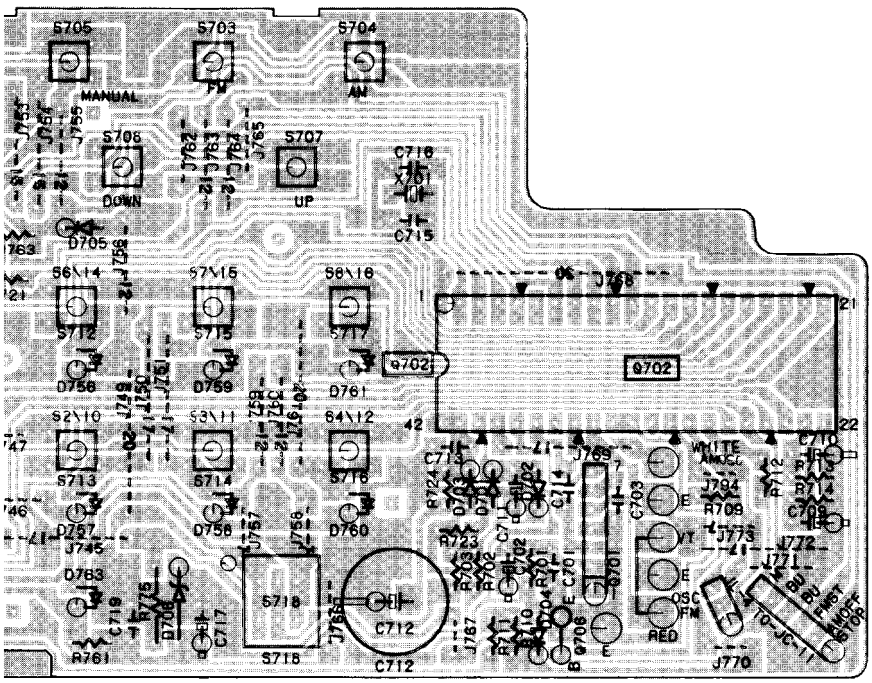
DIGITAL CIRCUIT PC BOARD

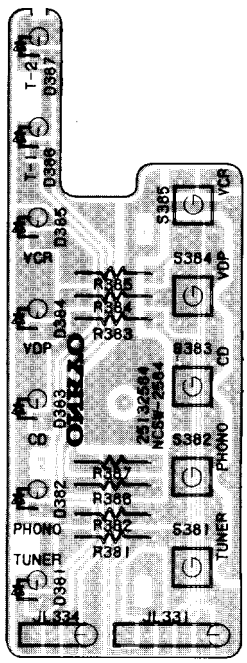


DIGITAL CIRCUIT PC BOARD(NADG-2581-2/2A/2B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q561,Q661	222502 or	NJM4558DX or
	222811	NJM4558DD
Q701	222675	TD6104P
Q702	222674	TC9147BP
Q703	222673	TD6301AP
	Fluorescent tube	
Q715	212016	FIP7B8CS
	Transistors	
Q562,Q662	2211945	2SK246(GR)
Q706-Q709	2211255,	2SC1815(GR),
Q717,Q718	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
Q710,Q711	2211254,	2SC1815(Y),
	2211255,	2SC1815(GR),
	2210746 or	2SC945A(P) or
	2212485	JC501(Q) <G/W>
Q712	2211455 or	2SA1015(GR) or
	2212495	JA101(Q) <G/W>
Q714	2212794	2SD1468(R)
Q721-Q724	2212600 or	DTA124ES or
	221243	2SA1346

CIRCUIT NO.	PART NO.	DESCRIPTION
	Diodes	
D561,D562	223155	1SS138
D701-D705	223155	1SS138
D706	2243152 or	MTZ5.6B or
	2239472	RD5.6EB2
D708,D709	223155	1SS138 <G/W>
D711	2241291	RD3.3EB1
	L.E.Ds	
D751,D762	225142	SEL2913K
D763,D774	225142	SEL2913K
D776,D777	225142	SEL2913K
D789	225142	SEL2913K
D752,D771	225137CG,	SEL2413ECG,
D754-D761	225137DG or	SEL2413EDG or
D767,D768	225137DY	SEL2413EDY
D773,D775	225137CG,	SEL2413ECG,
D778	225137DG or	SEL2413EDG or
	225137DY	SEL2413EDY
D753,D779	225141	SEL2213C
	X'tal	
X701	3010073	XTL7.2M
	Capacitors	
C562	352732209	22μF,10V,Elect.





SELECTOR SWITCH PC BOARD

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C565	352784799	0.47μF,50V,Elect.
C567,C667	353744709	47μF,16V,Elect.
C566,C666	352982296	0.22μF,50V,Non-polar elect.
C702	352744709	47μF,16V,Elect.
C708	352742209	22μF,16V,Elect.
C709	352780109	1 μF,50V,Elect.
C710	352780229	2.2 μF,50V,Elect.
C711	352784799	0.47μF,50V,Elect.
C712	3020027 or 3020018	0.047F,5V,Super
C717	353744709	47μF,16V,Elect.
C718	352721019	100 μF,6.3V,Elect.
C720	352750479	4.7 μF,25V,Elect.
C724	352742209	22μF,16V,Elect.
	Resistors	
R565	6142044	N30LL100KA15Z,Slide,variable
R729-R737	49121333409	33K ×9,1/8W,Network
R738-R750	49121333413	33K ×13,1/8W,Network
R775	442529104	91Ω,1/2W,Metal oxide film

CIRCUIT NO.	PART NO.	DESCRIPTION
	Switches	
S552	25035515	NPS-142-L477,Push
S703-S717	25035389	NPS-111-S353,Push
S718	25035514	NPS-122-L476,Push
	Lamp	
PL901	210064A	PL6.3V,0.25A
	Holders	
	27190438A	LED
	27190437A	LED 10
	Cushion	
	28140593	10×40×3.5
	Screws	
	833426060	2.6TTP+6P(BC),Tapping

SELECTOR SWITCH PC BOARD(NASW-2584-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	L.E.Ds	
D381-D385	225137CG, 225137DG or 225137DY	SEL2413ECG, SEL2413EDG or SEL2413EDY
D386,D387	225142	SEL2913K
	Switches	
S381-S385	25035291 or 25035389	NPS-111-S257 or NPS-111-S353, Push
	Holder	
	27190439	

Note: <D>:Only 120V model
<G>:Only 220V/240V models
<W>:Only Worldwide model

PRINTED CIRCUIT BOARD–PARTS LIST

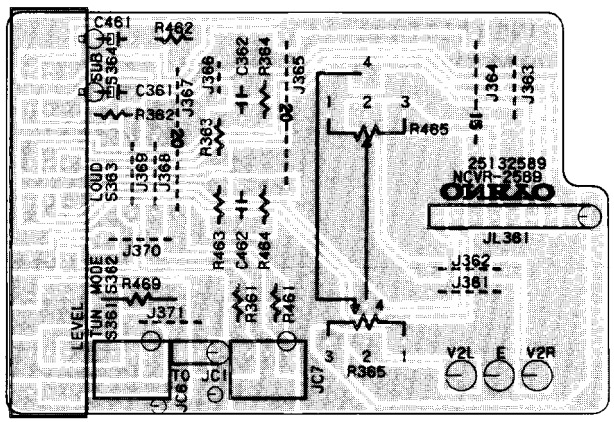
TONE CONTROL PC BOARD(NATC-2588-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
R371,R471	5146049	N16RLC250KWT30,Variable resistor,Balance
R372,R472	5148073	N16RQMC110K180K30,Variable resistor,Bass
R374,R474	5148102	N16RGMC219K30,Variable resistor, Treble

EQUALIZER AMPLIFIER PC BOARD(NAEQ-2582-2/2A)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q301,Q401	222671 or	NJM4559DD or
	222534	NJM4559DX
Q321,Q421	222954	TC9152P
Q331,Q431	222811 or	NJM4558DD or
	222502	NJM4558DX
	Transistors	
Q332,Q432	2211945	2SK246(GR)
Q333,Q433	2212286 or	2SC2878(B) or
	2212285	2SC2878(A)
Q341,Q342	2211455 or	2SA1015(GR) or
	2212495	JA101(Q)
Q343	2211255,	2SC1815(GR),
	2210746 or	2SC945A(P) or
	2212485	JC501(Q)
	Diodes	
D321,D322	223155	1SS138
D331,D340	223155	1SS138
D431	223155	1SS138
	Capacitors	
C302,C402	352780229	2.2 μF,50V,Elect.
C305,C405	352721019	100 μF,6.3V,Elect.
C308,C408	352780229	2.2 μF,50V,Elect.
C309,C310	352743319	330 μF,16V,Elect.
C322,C323	352780339	3.3 μF,50V,Elect.
C325	352780159	1.5 μF, 50V,Elect.
C331,C332	352780229	2.2 μF,50V,Elect.
C333,C433	352781099	0.1 μF,50V,Elect.
C334,C335	357280339	3.3 μF,50V,Elect.
C341	352780339	3.3 μF,50V,Elect.
C342	352782299	0.22μF,50V,Elect.
C431,C432	352780229	2.2 μF,50V,Elect.
	Terminals	
P301,P302	25045171	NPJ-4PDBL65 <D/W>
P301,P302	25045165	NPJ-4PDBL59 <G>
P303	25045191	NPJ-6PDBL75 <D/W>
P303	25045166	NPJ-6PDBL60 <G>
P304	25045171	NPJ-4PDBL65 <D/W>
P304	25045165	NPJ-4PDBL59 <G>
	Switches	
S321,S322	25035518	NPS-242-L480
S323	25065242	NSS-22104
	Socket	
	25050267	NSCT-3P95

NOTE: <D>:Only 120V model
<G>:Only 220V/240V models
<W>:Only Worldwide model



VOLUME CONTROL PC BOARD

VOLUME CONTROL PC BOARD(NAVR-2589-2)

CIRCUIT NO.	PART NO.	DESCRIPTION
R365,R465	5104180	N16RGH100KBT30,Variable resist(Volume
S362,S363	25035516	NPS-422-L478,Push switches
	25050280	NSCT-3P108,Sockets

HEADPHONE TERMINAL PC BOARD(NAHP-2590-1/1A)

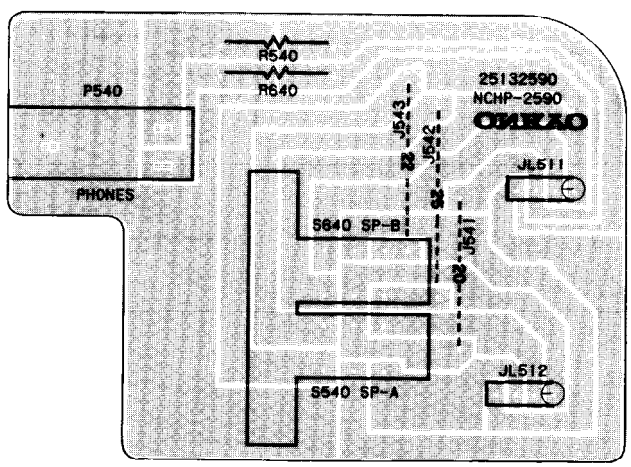
CIRCUIT NO.	PART NO.	DESCRIPTION
R540,R640	441523914	390 Ω,1/2W,Metal oxide film resistors
S540,S640	25035517	NPS-222-L479,Push switches
P540	25045184	HLJ0520-01-010,Headphone terminal <G/W>
	25045193	HLJ0521-01-010,Headphone terminal <D>

BAND SELECTOR SWITCH PC BOARD(NASW-2585-1)

(Only Worldwide model)

CIRCUIT NO.	PART NO.	DESCRIPTION
S701	25065240	NSS-42102,Slide switch

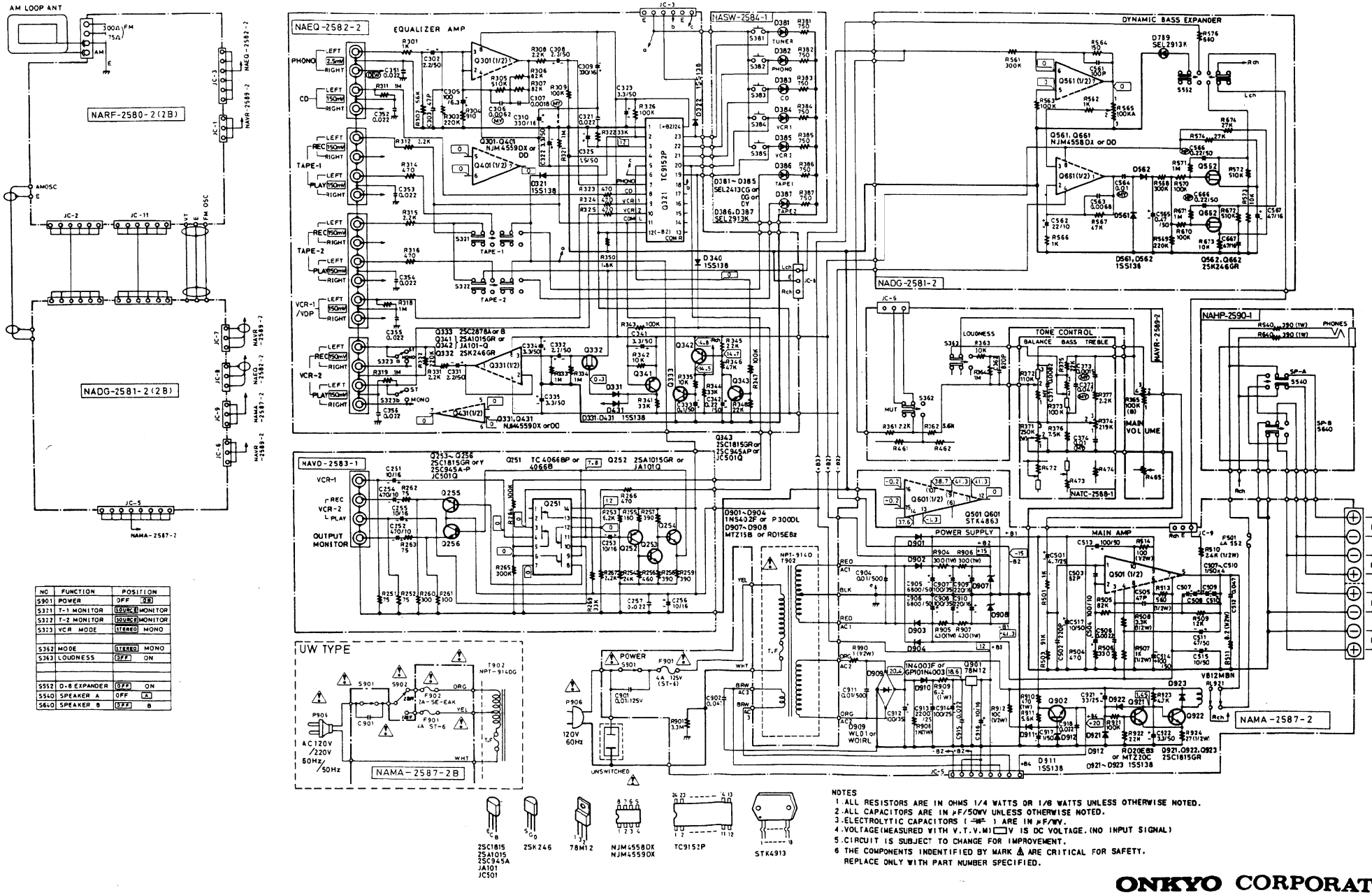
HEADPHONE TERMINAL PC BOARD



SCHEMATIC DIAGRAM

–AMPLIFIER SECTION–

–D/W MODELS–



NO	FUNCTION	POSITION
S901	POWER	OFF ON
S321	T-1 MONITOR	SOURCE MONITOR
S322	T-2 MONITOR	SOURCE MONITOR
S323	VCR MODE	STEREO MONO
S362	MODE	STEREO MONO
S363	LOUDNESS	OFF ON
S552	D-B EXPANDER	OFF ON
S540	SPEAKER A	OFF A
S640	SPEAKER B	OFF B

NOTES

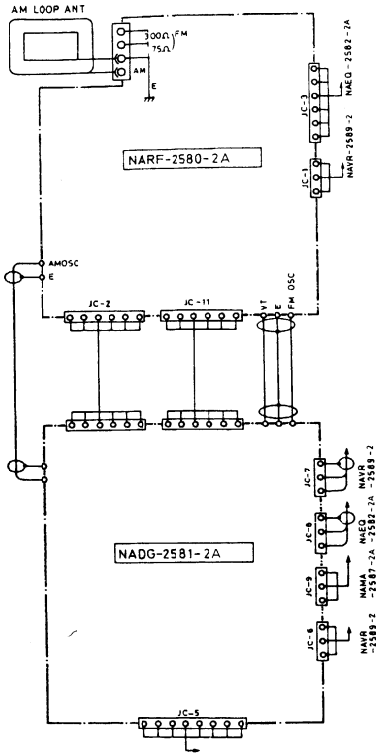
1. ALL RESISTORS ARE IN OHMS 1/4 WATTS OR 1/6 WATTS UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
3. ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
4. VOLTAGE (MEASURED WITH V.T.V.M) □ V IS DC VOLTAGE. (NO INPUT SIGNAL)
5. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
6. THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ONKYO CORPORATION

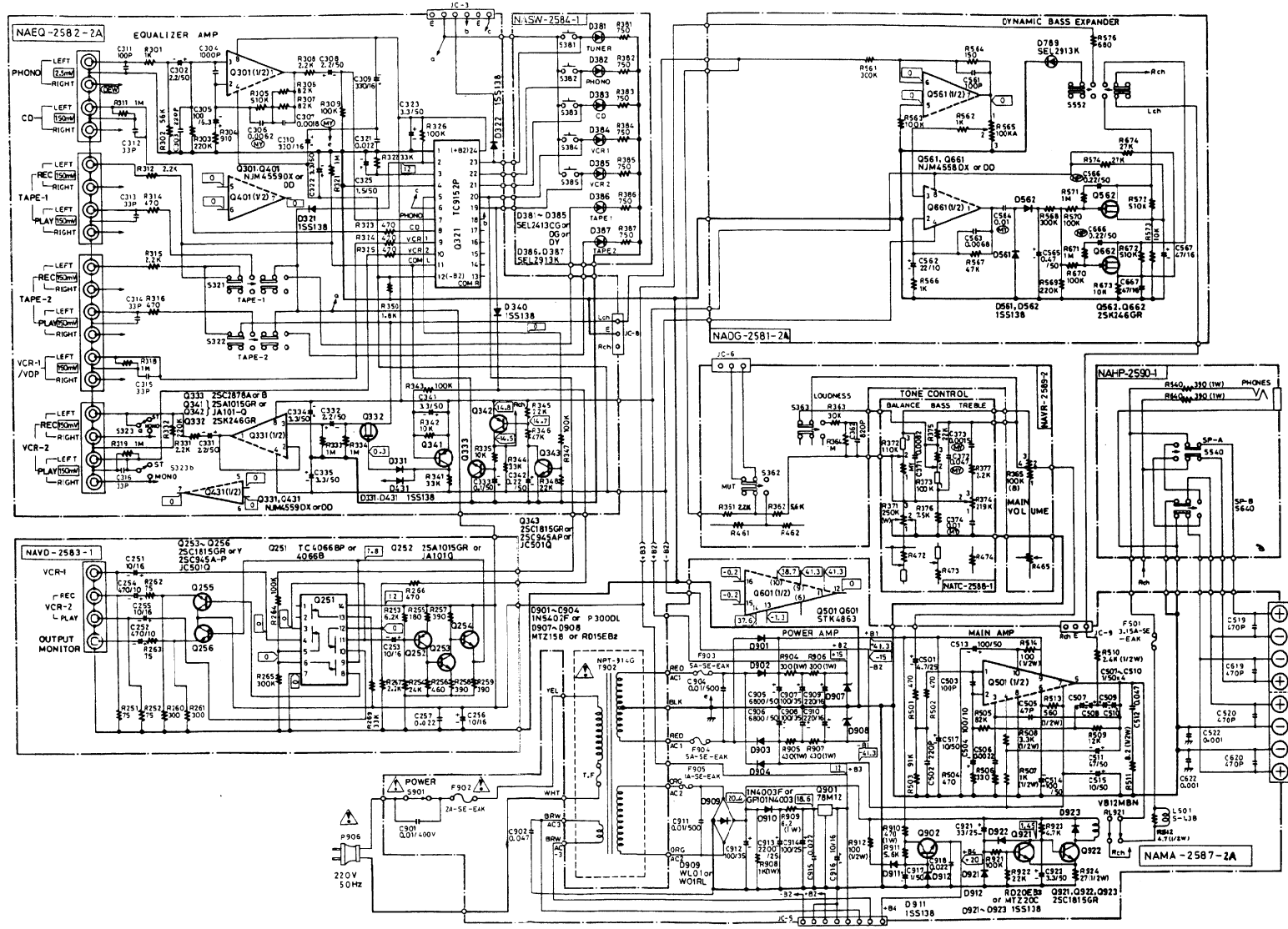
SCHEMATIC DIAGRAM

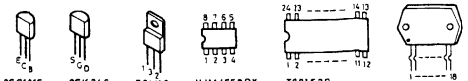
–AMPLIFIER SECTION–

–G/Q MODELS–



NO	FUNCTION	POSITION	
S901	POWER	OFF	ON
S321	T-1 MONITOR	SOURCE	MONITOR
S322	T-2 MONITOR	SOURCE	MONITOR
S323	VCR MODE	STEREO	MONO
S362	MODE	STEREO	MONO
S363	LOUDNESS	OFF	ON
S552	D-B EXPANDER	OFF	ON
S540	SPEAKER A	OFF	A
S640	SPEAKER B	OFF	B





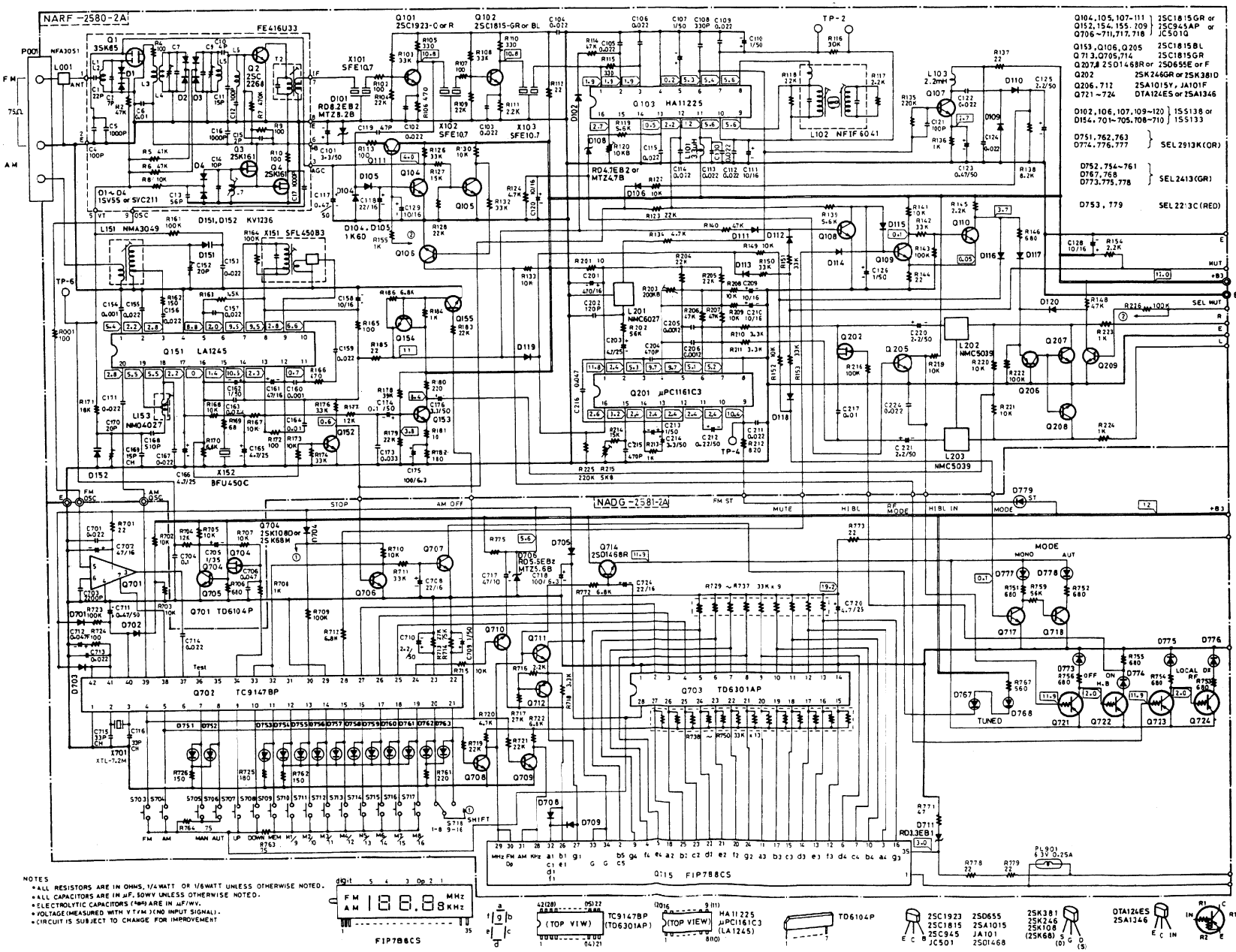
NOTES

1. ALL RESISTORS ARE IN OHMS 1/4 WATTS OR 1/8 WATTS UNLESS OTHERWISE NOTED.
2. ALL CAPACITORS ARE IN μF/50WV UNLESS OTHERWISE NOTED.
3. ELECTROLYTIC CAPACITORS (⊣⊢) ARE IN μF/WV.
4. VOLTAGE (MEASURED WITH V.T.V.M) □ V IS DC VOLTAGE. (NO INPUT SIGNAL)
5. CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT.
6. THE COMPONENTS INDENTIFIED BY MARK ⚠ ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

ONKYO CORPORATION

SCHEMATIC DIAGRAM

–TUNER SECTION–
–G/Q MODELS–



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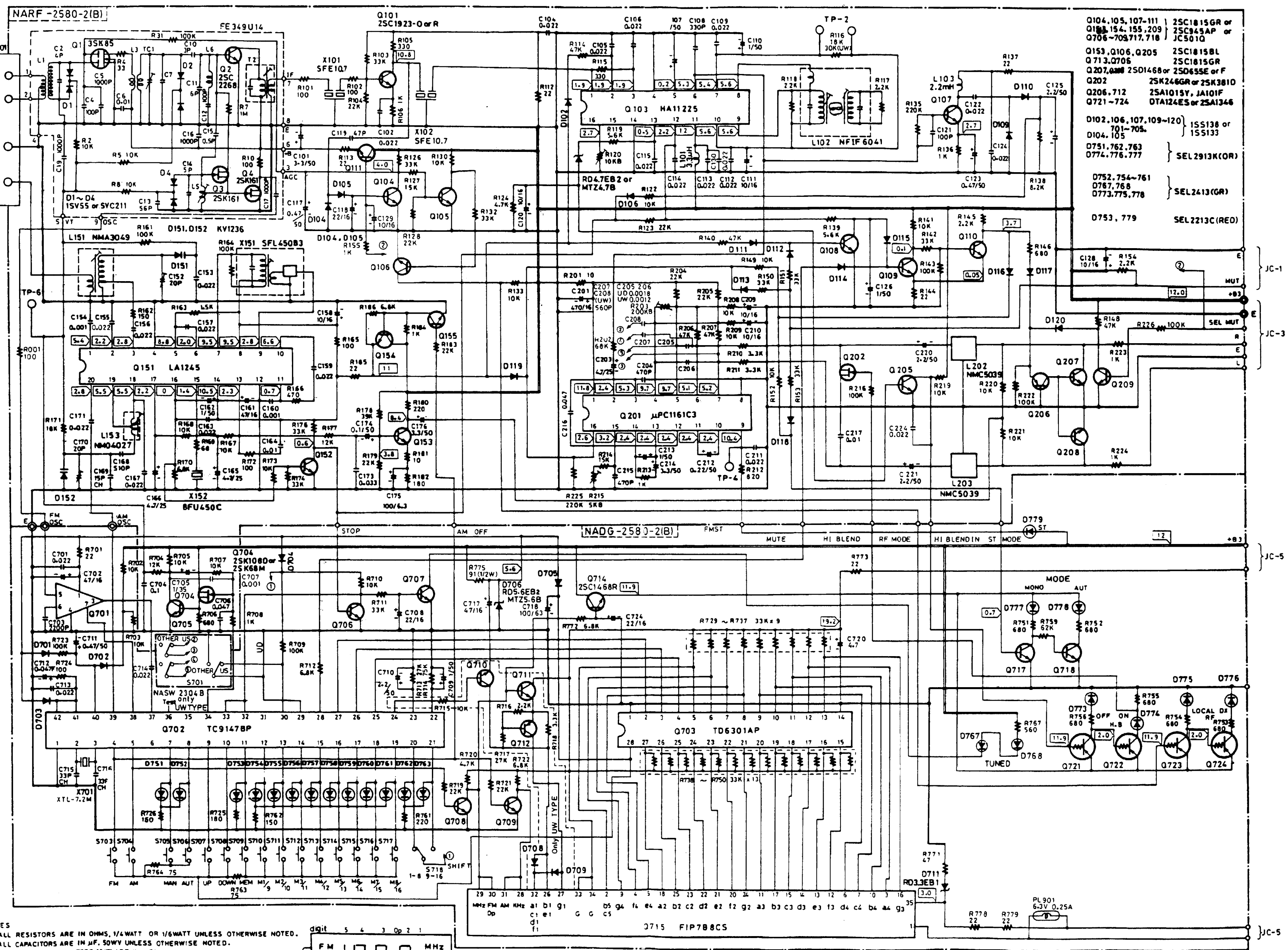
1	2	3	4	5	6	7

SCHEMATIC DIAGRAM

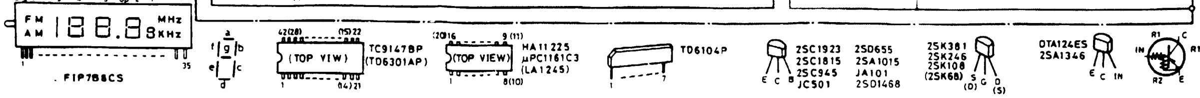
—TUNER SECTION—

—D/W MODELS—



NARF-2580-2(B)
FE349U14
NADG-2580-2(B)
Q101 2SC1923-O or R
Q103 HA11225
Q151 LA1245
Q201 µPC1161C3
Q702 TC9147BP
Q703 TD6301AP
D715 FIP7B8CS
Q104,105,107~111 / Q153,154,155,209 / Q706~709,717,718 — 2SC1815GR or 2SC945AP or JC501Q
Q153,Q106,Q205 — 2SC1815BL
Q713,Q706 — 2SC1815GR
Q207,Q208 — 2SD1468 or 2SD655E or F
Q202 — 2SK246GR or 2SK381D
Q206,712 — 2SA1015Y, JA101F
Q721~724 — DTA124ES or 2SA1346
D102,106,107,109~120 / 701~705. / D104,105 — 1SS138 or 1SS133
D751,762,763 / D774,776,777 — SEL2913K(OR)
D752,754~761 / D767,768 / D773,775,778 — SEL2413(GR)
D753, 779 — SEL2213C(RED)
JC-1
JC-3
JC-5
STOP
AM OFF
FMST
MUTE
HI BLEND
RF MODE
HI BLENDIN
ST MODE
MODE
MONO
AUT
TUNED
LOCAL DX RF
PL901 6.3V 0.25A

NOTES
- ALL RESISTORS ARE IN OHMS, 1/4WATT OR 1/6WATT UNLESS OTHERWISE NOTED.
- ALL CAPACITORS ARE IN µF, 50WV UNLESS OTHERWISE NOTED.
- ELECTROLYTIC CAPACITORS (+|(-) ARE IN µF/WV.
- VOLTAGE(MEASURED WITH VTVM)(NO INPUT SIGNAL).
- CIRCUIT IS SUBJECT TO CHANGE FOR IMPROVEMENT



ONKYO CORPORATION

PRINTED CIRCUIT BOARD-PARTS LIST

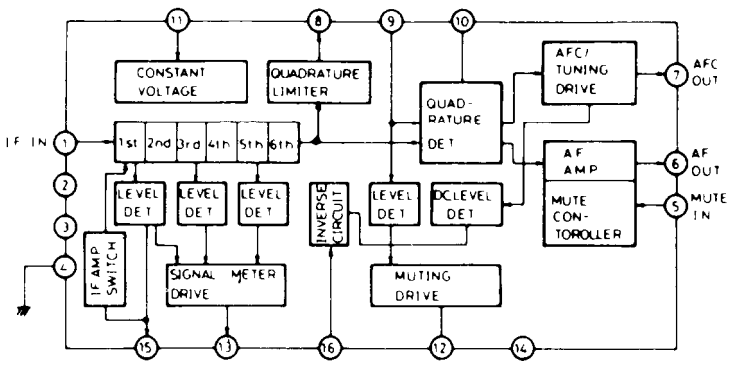
POWER AMPLIFIER AND POWER SUPPLY CIRCUIT PC BOARD(NAMA-2587-2/2A/2B)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q501,Q601	222054	STK-4863
Q901	222780122	78M12
	Transistors	
Q902	2211255	2SC1815(GR)
Q921,Q922	2211255	2SC1815(GR)
	Diodes	
D901-D904	22380003 or	1N5402F or
	223897	P-300DL
D907,D908	2243252 or	MTZ15B or
	2239672	RD15EB2
D909	223890 or	W01RL or
	223862	WL01
D910	223896 or	1N4003F or
	223880	GP101N4003
D911	223155	1SS138
D912	2239733 or	RD20EB3 or
	2243283	MTZ20C
D921-D923	223155	1SS138
	Coils	
L501,L601	231001	S-1.3B ‹G›

CIRCUIT NO.	PART NO.	DESCRIPTION
	Capacitors	
C501,C601	352750479	4.7 μF,25V,Elect.
C504,C604	3500080	100 μF,10V,Elect.‹D/W›
	352731019	100 μF,10V,Elect.‹G›
C507-C510	352780109	1 μF,50V,Elect.
C607-C610	352780159	1 μF,50V,Elect.
C511,C611	3500081	47μF,63V,Elect.‹D/W›
C511,C611	352784709	47μF,50V,Elect.‹G›
C513,C514	352781019	100 μF,50V,Elect.
C515,C615	352781009	10μF,50V,Elect.
C517	352781009	10μF,50V,Elect.
C901	3500065A	⚠DE7150FZ103PAC400V/125V,IS
C905,C906	3504152	6,800 μF,50V,Elect.
C907,C908	352761019	100 μF,35V,Elect.
C909,C910	352742219	220 μF,16V,Elect.
C912	352761019	100 μF,35V,Elect.
C913	352752229	2,200 μF,25V,Elect.
C914	352751019	100 μF,25V,Elect.
C916	352741009	10μF,16V,Elect.
C917	352780109	1 μF,50V,Elect.
C921	352753309	33μF,25V,Elect.
C922	352780339	3.3 μF,50V,Elect.
	Resistors	
R507,R607	441521024	1kΩ,1/2W,Metal oxide film
R508,R608	441523324	3.3kΩ,1/2W,Metal oxide film
R510,R610	441522424	2.4kΩ,1/2W,Metal oxide film
R511,R611	441520474	4.7 Ω,1/2W,Metal oxide film
R512,R612	441520474	4.7 Ω,1/2W,Metal oxide film ‹G›
R513	441525614	560 Ω,1/2W,Metal oxide film
R514	441521014	100 Ω,1/2W,Metal oxide film
R901	431523355	⚠3.3MΩ,1/2W,Solid ‹D›
R904,R906	441623014	300 Ω,1W,Metal oxide film
R905,R907	441624714	470 Ω,1W,Metal oxide film
R908	441621024	1kΩ,1W,Metal oxide film
R909	441620624	6.2 Ω,1W,Metal oxide film
R910	441624714	470 Ω,1W,Metal oxide film
R912	441521014	100 Ω,1/2W,Metal oxide film
R924	441522704	27Ω,1/2W,Metal oxide film
R990	441520104	1 Ω,1/2W,Metal oxide film ‹D›
	Terminal	
P501	25060093	NTM-8P-DML34,Speaker ‹D/W›
P501	25060094	NTM-8P-DML35,Speaker ‹G›
	Switch	
S901	25035398	⚠NPS-111-L362P,Power
	Relay	
RL921	25065134	NRL-2P5A-DC24-07
	Fuseholders	
	250113	⚠SN5051 ‹D/W›
	25050065	⚠YSH403T ‹G/W›
	Fuses	
F501,F601	252059	⚠4A(SS-2) ‹D/W›
F501,F601	252076	⚠3.15A-SE-EAK ‹G›
F901	252049	⚠4A(ST-6) ‹D/W›
F902	252074	⚠2A-SE-EAK ‹G/W›
F903,F904	252078	⚠5A-SE-EAK ‹G›
F905	252070	⚠1A-SE-EAK ‹G›
	Sockets	
	25050267	NSCT-3P-95
	25050272	NSCT-8P-100
	Label	
	29360626-1	Fuse ‹D›
	29360472	T3.15A/250V ‹G›
	Bracket	
	27141059	Ground ‹D›

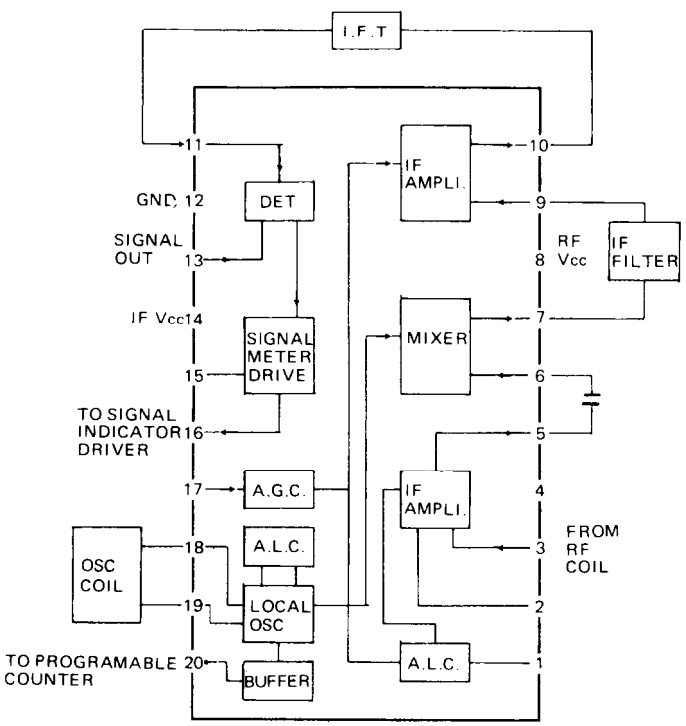
BLOCK DIAGRAM OF IC

HA–11225(FM IF system)

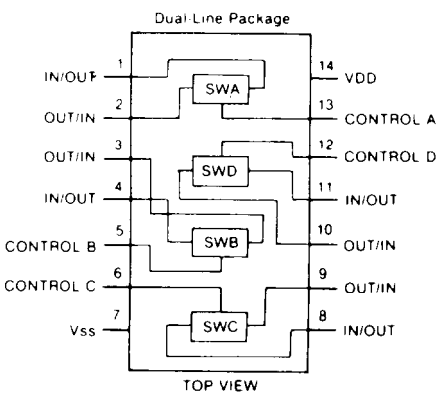


1. IF signal input
2. IF amplifier swi
   Off at high level
5. Muting switch ir
6. Composite signal
7. AFC output
8. IF signal output
9. 10.7MHz signal
10. Reference voltag
11. Power supply
12. Muting output
    Tuned:L level
13. Signal strength
15. AGC output
16. Muting level set

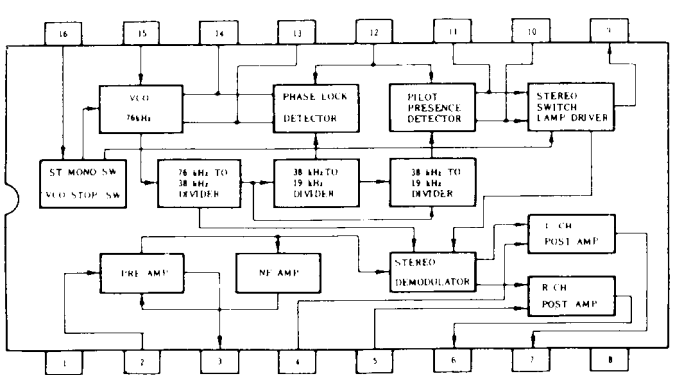
LA–1245(AM radio system)



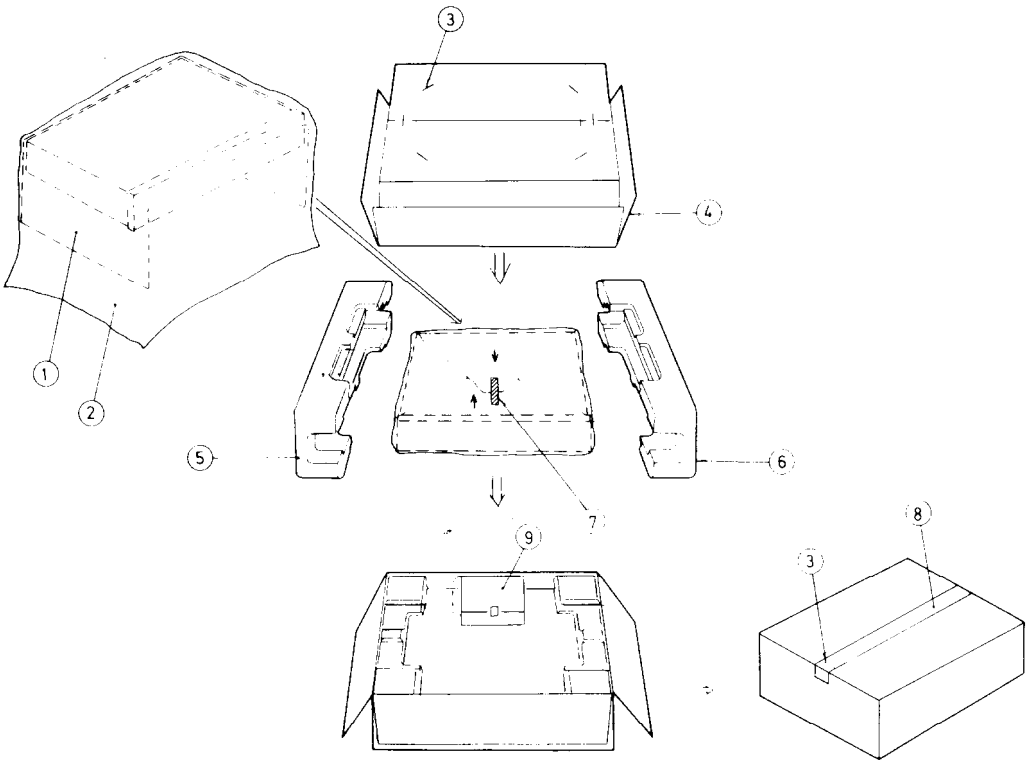
4066B(Analog switch)



μPC1161C3(Stereo decoder)



PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29095012-1	500 ×800mm,Protection sheet 〈B〉
2	29100034	650 ×850mm,Poly-vinyl bag
3	282301	Sealing hook
4	29051276	Master carton box 〈S〉
	29051277	Master carton box 〈B〉
5	29090817A	Pad R
6	29090816B	Pad L
7	29110032	W=15mm,Adhesive tape
8	260012	W=50mm,Damplon tape
9	Accessory bag ass'y	
	U.S.A. model	
	292064A	FM antenna
	29340980	Instruction manual
	232085	NMA-3034,AM loop antenna
	29365006-7	Warranty card
	29368002C	Service station list
	29100006A	250 ×350mm,Poly-vinyl bag

NOTE: 〈B〉:Only black model
〈S〉:Only silver model

REF.NO.	PART NO.	DESCRIPTION
	120V model	
	292064A	FM antenna
	29340980	Instruction manual
	232085	NMA-3034,AM loop antenna
	29100006A	250 ×350mm,Poly-vinyl bag
	220V model	
	292092	FM antenna
	29340981	Instruction manual
	232085	NMA-3034,AM loop antenna
	29100006A	250 ×350mm,Poly-vinyl bag
	Worldwide model	
	292064A	FM antenna
	29340981	Instruction manual
	232085	NMA-3034,AM loop antenna
	29100006A	250 ×350mm,Poly-vinyl bag
	25055040	CV-K-2,Conversion plug
	240V model	
	292092	FM antenna
	29340981	Instruction manual
	232085	NMA-3034,AM loop antenna
	29100006A	250 ×350mm,Poly-vinyl bag
	25060088	Antenna adaptor FM

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